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LVACTUAL TRAJECTORY OF MERCURY-REDSTONE
FLIGHT TEST MR-4 (U)

by

Harold Ledford

22 Sept. 1961

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MTP-AERO-61-76

ACTUAL TRAJECTORY OF MERCURY-REDSTONE
FLIGHT TEST MR-4 (U)

By Harold Ledford

(U) ABSTRACT

This report contains the post flight trajectories for capsule and booster of Mercury-Redstone test flight MR-4. The parameters presented are position, velocity, acceleration, trajectory angle, Mach number and dynamic pressure.

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ACTUAL TRAJECTORY OF MERCURY-REDSTONE
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AEROBALLISTICS DIVISION

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(U) TABLE OF CONTENTS

	Page
Summary	1
Discussion.	1
General	1
Booster	3
Capsule	4

LIST OF ILLUSTRATIONS AND TABLES

Figure	Page
1. Separation Distance Between Capsule and Booster	7
2. Tracking Comparisons (Tracking-Reference)	8
3. Impact Area	9

Table

BOOSTER		
IIB	Cartesian Position Coordinates.	10
IIB	Range, Altitude, Mach Number and Dynamic Pressure . . .	21
IIIB	Earth-fixed Velocity, Tangential Acceleration and Trajectory Angles	32
CAPSULE		
IC	Cartesian Position Coordinates.	43
IIC	Range, Altitude, Mach Number and Dynamic Pressure . . .	48
IIIC	Earth-fixed Velocity, Tangential Acceleration and Trajectory Angles	53

LIST OF SYMBOLS

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Symbols	Definitions
X	Cartesian coordinates with X Z plane tangent to the earth's surface at the launch site. The positive X coordinate is 100° E of N; the positive Z coordinate is 190° E of N. The positive Y coordinate is perpendicular upward from the X Z plane at the point of tangency.
Alt.	Altitude, height above the geoid as represented by the Clarke Spheroid of 1866.
Range	Distance along the surface of the earth.
Mach	Ratio of velocity of vehicle to local velocity of sound.
Q	Dynamic pressure
Vg	Earth-fixed geometric vehicle velocity.
\dot{V}_g	Tangential vehicle acceleration.
Theta P.L.	The angle between the earth-fixed vehicle velocity and the local vertical. Defined mathematically as
	$\cos^{-1} \left[\frac{\dot{X}\dot{X} + (Y + r_0) \dot{Y} + Z\dot{Z}}{Vg \sqrt{\dot{X}^2 + (Y + r_0)^2 + Z^2}} \right]$
Theta Y	The angle between the earth-fixed vehicle velocity and its projection into the XY plane. Defined mathematically as $\sin^{-1} Z/Vg$.

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ACTUAL TRAJECTORY OF MERCURY-REDSTONE
FLIGHT TEST MR-4 (U)

By Harold Ledford

(U) SUMMARY

This report contains the post flight trajectories for capsule and booster of Mercury-Redstone test flight MR-4. The parameters presented are position, velocity, acceleration, trajectory angle, Mach number and dynamic pressure.

DISCUSSION

(C) Mercury-Redstone test flight MR-4 was launched from AMR on July 21, 1961 at 0720:36 EST. MR-4 was the second of a series of flights with a primary mission of placing a manned capsule into a ballistic trajectory with safe recovery.

Trajectories for both capsule and booster are presented in this report. The capsule trajectory was established in order to show its position relative to that of the booster from separation to impact. The official capsule trajectory will be published by Space Task Group.

The following tracking data was available for establishing the post flight trajectories of both capsule and booster:

.48	-	26.00	sec	Fixed Camera
3.0	-	133.0	sec	Theodolite
10.0	-	185.6	sec	Azusa
10.0	-	501.0	sec	Dovap
0.0	-	510.8	sec	FPS-16 Radar 1.16 (Capsule)
102.8	-	510.8	sec	FPS-16 Radar 3.16 (Capsule)
163.0	-	509.4	sec	FPS-16 Radar 5.16 (Capsule)

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All times are referenced to Range Zero (0720:36 EST). Liftoff occurred .47 sec after Range Zero.

The origin of the coordinate systems used for capsule and booster trajectories in launch pad 5 which has the following geographical coordinates based on the Clarke Spheroid of 1866:

Geodetic Latitude: 28.439139° N
 Longitude : 80.573521° W

Mach number and dynamic pressure are based on measured Cape Canaveral meteorological data to 32.7 km altitude in the ascent and adjusted to the 1959 ARDC atmosphere at 47.0 km. The 1959 ARDC atmosphere was used above 47.0 km for the capsule and booster trajectories in both ascent and descent. Grand Bahama Island atmosphere was used below 47.0 km in the descent.

The smoothing and differentiation procedures used in these calculations round off the large transients which occur around cutoff; consequently, variables in this interval, 142 ± 3 sec, should not be used in any performance estimates. Several trajectory parameters at cutoff are compared with the nominal values below.

	Actual	Predicted	Act - Pred
Range Time (sec)	142.04	143.47	-1.43
Altitude (km)	60.80	61.25	-.45
Range (km)	37.35	38.22	-.87
Lateral Displacement (km)	.15	.29	-.14
Earth-fixed Velocity (m/s)	2005.3	1994.0	+11.3
Longitudinal Velocity (m/s)	3279.1*	3276.6	+2.5
Local Pitch Trajectory Angle (deg)	41.42	41.78**	-.36
Yaw Trajectory Angle (deg)	.50	.32**	.18

* Longitudinal velocity is the integral of the inertial acceleration along the longitudinal axis of the vehicle with the actual values taken from external tracking data.

** If the wind effects are taken into consideration the predicted local pitch trajectory angle would be 41.64° and the yaw trajectory angle $.39^{\circ}$. Both are in good agreement with the nominal.

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3

The relative velocity between capsule and booster obtained from the posigrade rocket firing was about 10.5 m/s. The actual and expected separation distances between the capsule and booster are shown in Figure 1. The separation distances at retro-rocket ignition, retro-rocket burnout, and impact are given below:

	Separation Distance		
	Actual	Expected*	Difference
Retro-rocket Ignition (km)	1.54	1.21	.33
Retro-rocket Burnout (km)	.48	.52	-.04
Impact (km)	29.6	26.1	3.5

- * This is based on a relative velocity from the posigrade rockets of 7.3 m/s between capsule and booster. STG favors a predicted value of 9.5 m/s. The uncertainty is due to the "popgun" effect.

(C) Booster Trajectory

The booster trajectory presented in this report was established from the following data:

0.0 - 10.0 sec : Theodolite
 10.0 - 465.0 sec: Dovap
 465.0 - Impact : Calculated trajectory using Dovap positions and velocities at 465.0 sec as initial conditions.

Tables IB through IIIB contain the booster trajectory from liftoff to impact with variables given in 0.5 sec intervals through powered flight and in 5.0 sec intervals thereafter.

Figure 2 is a comparison of the other available tracking with the reference trajectory (Dovap). The maximum average differences in the position coordinates during powered flight were:

Deviations

Theodolite	9 m
Azusa	17 m

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A calculated trajectory was established from 465.0 sec to impact using Dovap positions and velocities as initial conditions. An aerodynamic drag coefficient consistent with an assumption of a tumbling body was used in these calculations. Rawinsonde winds from Grand Bahama Island were also used in the computations for the terminal phase of flight.

(C) Impact Point (Booster)

The nominal impact point of the booster (both with and without actual winds) is compared with the post flight impact determination in Figure 3. Measured Cape Canaveral winds were used for the powered flight of the precalculated trajectory and Rawinsonde winds from Grand Bahama Island for the terminal phase of flight of both the precalculated and post flight trajectories.

The impact location determined from the nominal trajectory (no winds) was:

Geodetic Latitude: 27.437361° N
Longitude : 75.457086° W

The miss distance with reference to the nominal trajectory is shown below:

Δ Range (km)	Δ Cross Range (km)	Radial (km)
6.1 over	1.2 right	6.2

If the effects of the winds are taken into consideration in the nominal trajectory the miss distance would be 7.1 km over in range and 1.3 right in cross range with a radial miss distance of 7.2 km.

The excessive range of the booster was primarily attributed to a 11 m/s higher than predicted earth-fixed booster cutoff velocity.

Figure 3 is a plot of the impact area.

(C) Capsule Trajectory

The capsule trajectory presented in this report was established from the following data:

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Separation - 450.0 sec FPS-16 Radar 3.16
 450.0 - Impact Computed trajectory using FPS-16
 Radar 3.16 positions and velocities
 at 450.0 sec as initial conditions.

Tables IC through IIIC contain the capsule trajectory from separation to impact with variables given in 5.0 sec intervals.

In the calculations of the capsule trajectory it was assumed that both the drogue and main chutes opened at the predicted altitudes (21,000 ft and 10,000 ft respectively). The Rawinsonde winds from Grand Bahama Island were also included in the calculations of the terminal phase of flight.

(C) Impact Point (Capsule)

The nominal impact location of the capsule (both with and without measured winds) is compared with the post flight determination in Figure 3. Rawinsonde winds from Grand Bahama Island were used in the trajectory calculations for the terminal phase of flight.

The impact location determined from the nominal trajectory (no winds) was:

Geodetic Latitude: 27.504920° N
 Longitude : 75.802025° W

The impact locations from both the trajectory calculation and Sofar Bomb are compared with the nominal trajectory below:

	Δ Range (km)	Δ Cross Range (km)	Radial (km)	Estimated CEP (km)
Post Flight Trajectory	3.4 over	5.1 left	6.1	2
Sofar Bomb	2.6 over	3.1 left	4.0	2 - 15

The miss distance calculations would be changed considerably if wind effects were included in the nominal trajectory. The post flight trajectory would then be 6.6 km over in range and 4.2 km left in cross range with a radial miss distance of 7.8 km.

The additional range of the capsule was largely due to a higher than predicted booster cutoff velocity.

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A comparison of booster and capsule miss distances indicates that the capsule impacted to the left of the booster. This is directly attributable to the retro-rockets' firing at approximately 5.6° to the left of the flight path which caused a 15 m/s decrease in the lateral velocity component.

All impact determinations are shown in Figure 3

See page iv for a list of trajectory symbols and their definitions.

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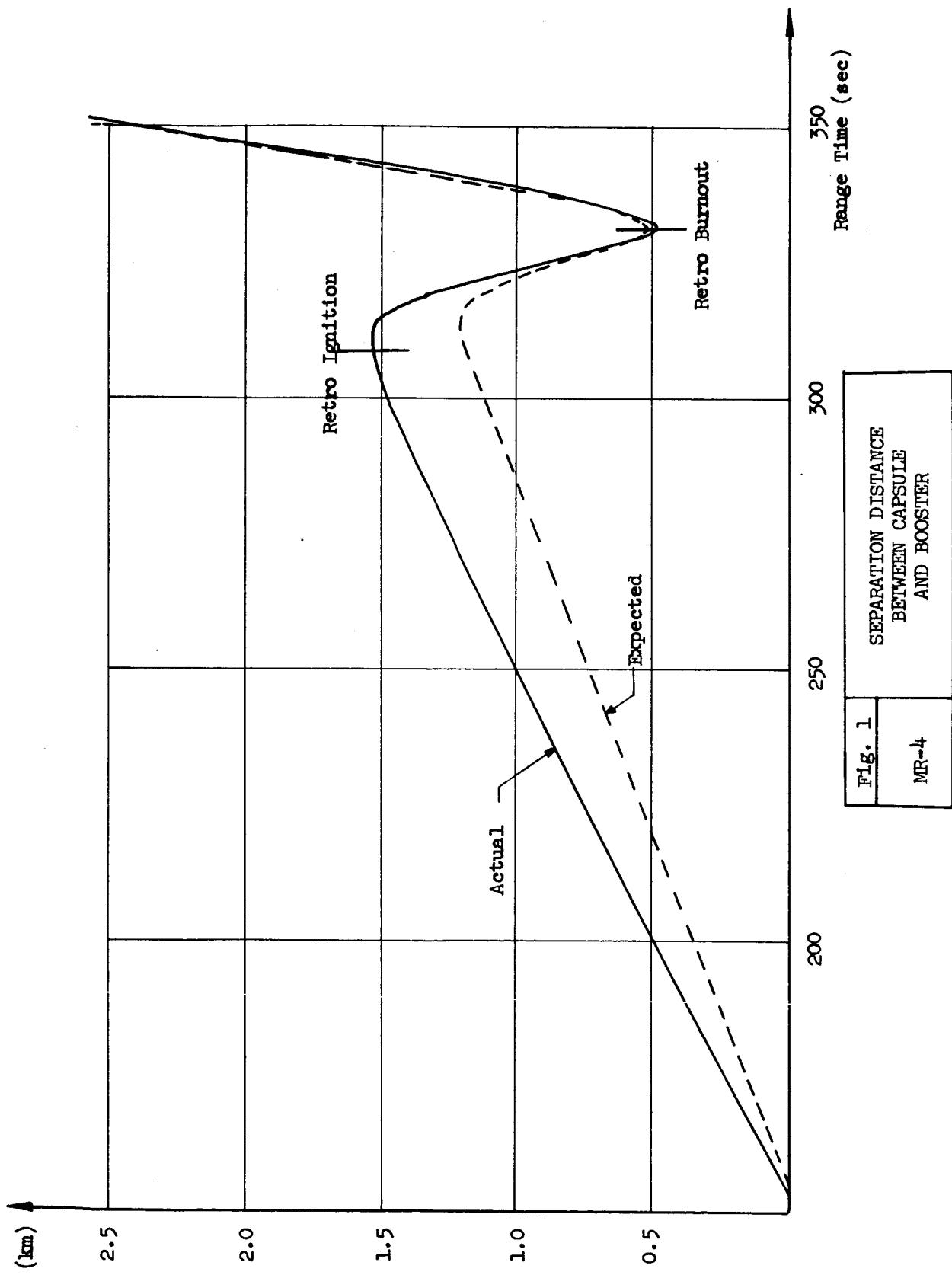


Fig. 1
SEPARATION DISTANCE
BETWEEN CAPSULE
AND BOOSTER

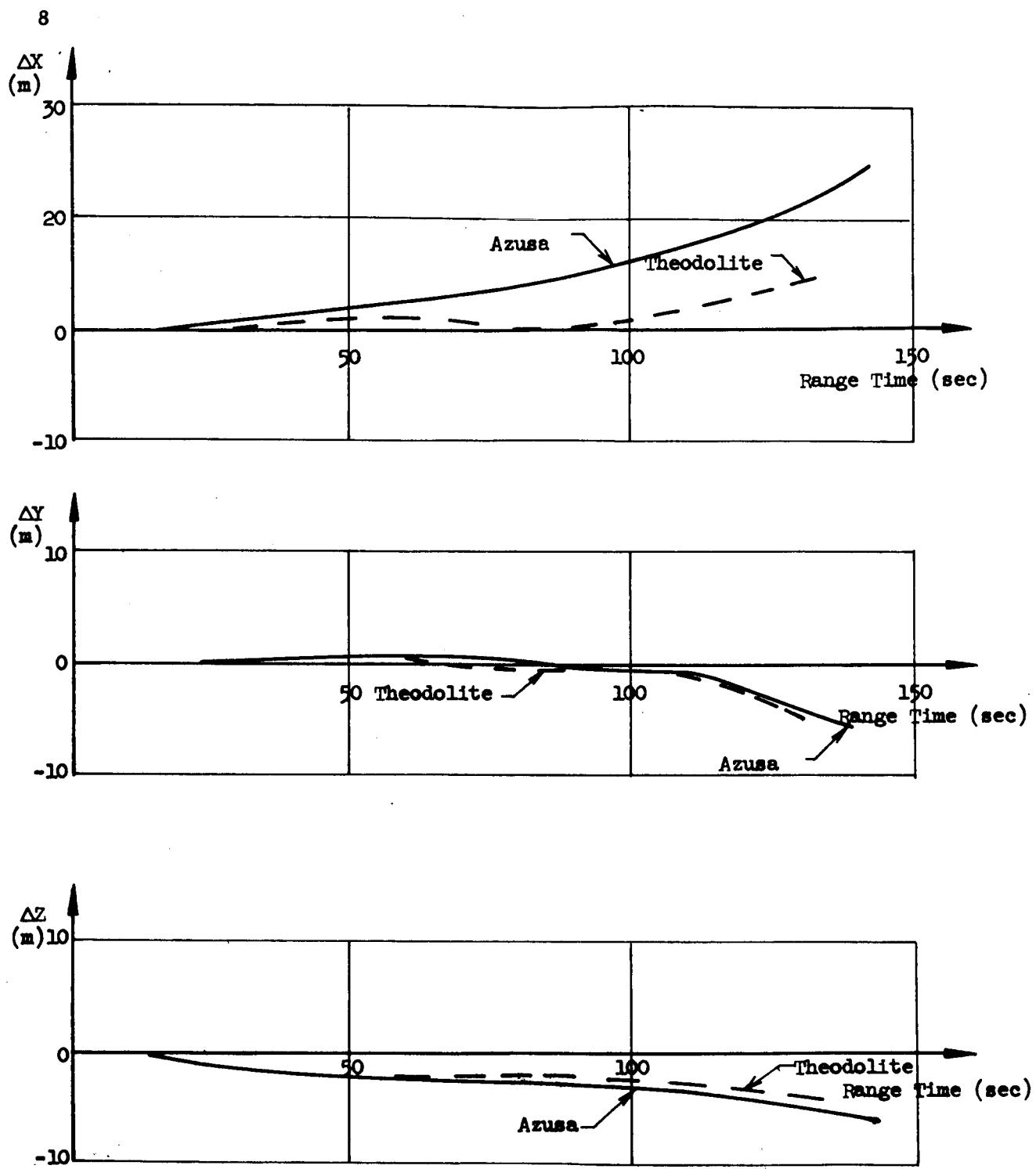
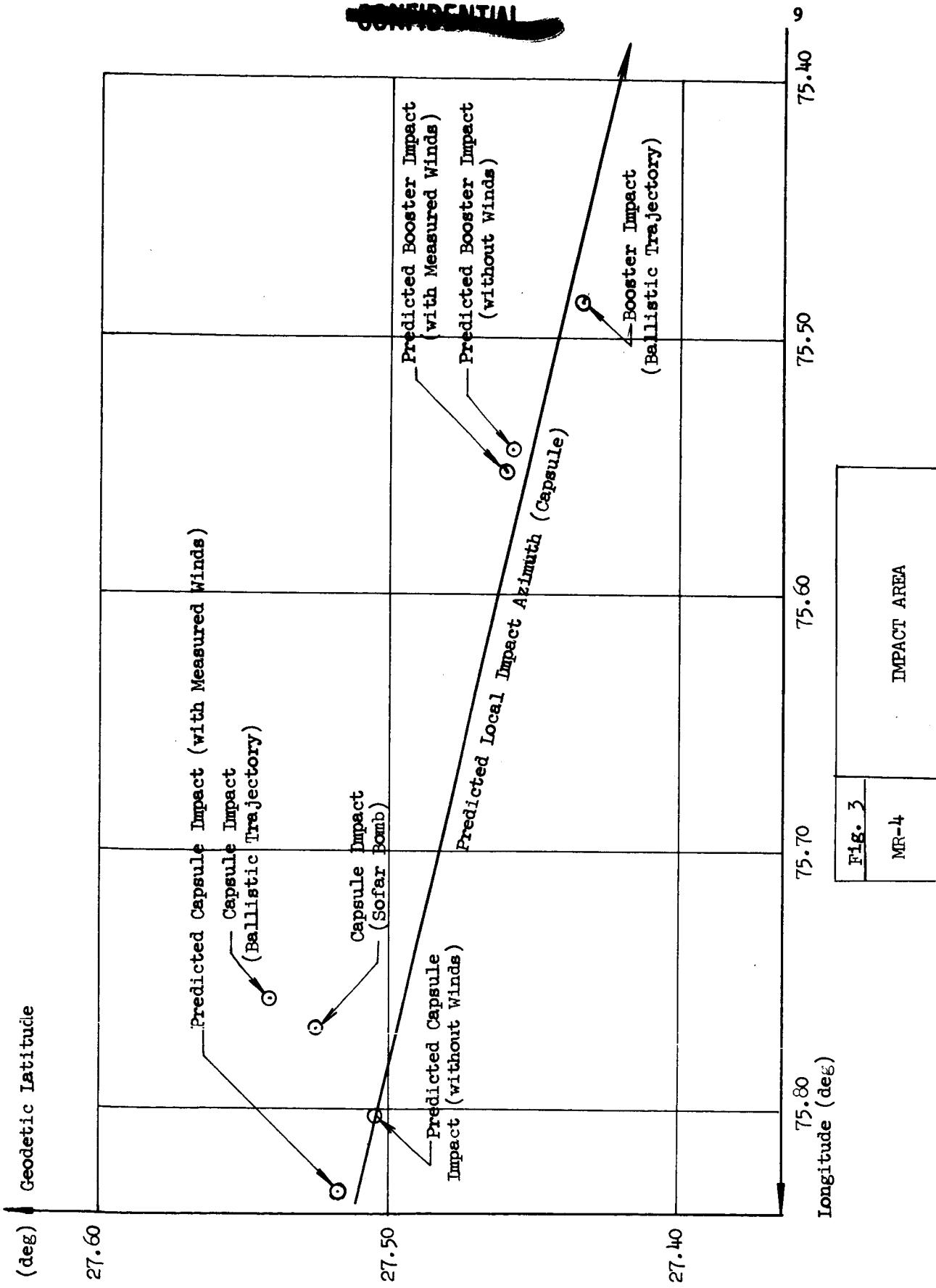


Fig. 2	TRACKING COMPARISONS (TRACKING-REFERENCE)
MR-4	



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BOOSTER

TABLE I B

T SEC	X M	Y M	Z M
+0000.00	+00000000.	+00000000.	+00000000.
+0000.50	+00000000.	+00000000.	+00000000.
+0001.00	+00000000.	+00000000.	+00000000.
+0001.50	+00000000.	+00000000.	+00000000.
+0002.00	+00000000.	+00000000.	+00000000.
+0002.50	+00000000.	+00000000.	+00000000.
+0003.00	+00000000.	+00000007.	-00000000.
+0003.50	+00000000.	+00000010.	+00000000.
+0004.00	+00000000.	+00000013.	-00000000.
+0004.50	+00000000.	+00000016.	+00000000.
+0005.00	+00000001.	+00000020.	+00000000.
+0005.50	+00000001.	+00000024.	-00000000.
+0006.00	+00000001.	+00000029.	-00000000.
+0006.50	+00000001.	+00000034.	-00000000.
+0007.00	+00000001.	+00000040.	-00000000.
+0007.50	+00000001.	+00000046.	-00000000.
+0008.00	+00000002.	+00000053.	-00000001.
+0008.50	+00000001.	+00000060.	-00000001.
+0009.00	+00000002.	+00000068.	-00000001.
+0009.50	+00000001.	+00000076.	-00000001.
+0010.00	+00000002.	+00000085.	-00000001.
+0010.50	+00000002.	+00000094.	-00000001.
+0011.00	+00000002.	+00000104.	-00000001.
+0011.50	+00000002.	+00000115.	-00000002.
+0012.00	+00000002.	+00000126.	-00000002.
+0012.50	+00000003.	+00000137.	-00000002.
+0013.00	+00000003.	+00000150.	-00000002.
+0013.50	+00000003.	+00000163.	-00000002.
+0014.00	+00000003.	+00000176.	-00000002.
+0014.50	+00000003.	+00000190.	-00000003.
+0015.00	+00000003.	+00000205.	-00000003.
+0015.50	+00000004.	+00000220.	-00000003.
+0016.00	+00000004.	+00000236.	-00000003.
+0016.50	+00000004.	+00000253.	-00000004.
+0017.00	+00000004.	+00000270.	-00000004.
+0017.50	+00000004.	+00000288.	-00000004.
+0018.00	+00000005.	+00000306.	-00000004.
+0018.50	+00000005.	+00000326.	-00000005.
+0019.00	+00000005.	+00000346.	-00000005.
+0019.50	+00000005.	+00000366.	-00000005.

TABLE I

T SEC	X M	Y M	Z M
+0020.00	+00000005.	+00000388.	-00000006.
+0020.50	+00000005.	+00000410.	-00000006.
+0021.00	+00000006.	+00000432.	-00000007.
+0021.50	+00000006.	+00000456.	-00000007.
+0022.00	+00000006.	+00000480.	-00000008.
+0022.50	+00000006.	+00000506.	-00000008.
+0023.00	+00000007.	+00000531.	-00000009.
+0023.50	+00000007.	+00000558.	-00000009.
+0024.00	+00000007.	+00000585.	-00000010.
+0024.50	+00000007.	+00000613.	-00000010.
+0025.00	+00000007.	+00000642.	-00000011.
+0025.50	+00000007.	+00000672.	-00000012.
+0026.00	+00000007.	+00000703.	-00000012.
+0026.50	+00000007.	+00000734.	-00000013.
+0027.00	+00000008.	+00000766.	-00000014.
+0027.50	+00000008.	+00000800.	-00000014.
+0028.00	+00000009.	+00000834.	-00000015.
+0028.50	+00000009.	+00000869.	-00000016.
+0029.00	+00000009.	+00000904.	-00000017.
+0029.50	+00000010.	+00000941.	-00000017.
+0030.00	+00000011.	+00000977.	-00000014.
+0030.50	+00000011.	+00001016.	-00000015.
+0031.00	+00000012.	+00001055.	-00000016.
+0031.50	+00000012.	+00001096.	-00000016.
+0032.00	+00000013.	+00001137.	-00000017.
+0032.50	+00000014.	+00001179.	-00000018.
+0033.00	+00000015.	+00001223.	-00000019.
+0033.50	+00000016.	+00001267.	-00000020.
+0034.00	+00000017.	+00001312.	-00000021.
+0034.50	+00000018.	+00001358.	-00000022.
+0035.00	+00000020.	+00001406.	-00000023.
+0035.50	+00000022.	+00001454.	-00000024.
+0036.00	+00000023.	+00001503.	-00000025.
+0036.50	+00000024.	+00001554.	-00000027.
+0037.00	+00000027.	+00001605.	-00000028.
+0037.50	+00000029.	+00001657.	-00000029.
+0038.00	+00000031.	+00001711.	-00000030.
+0038.50	+00000033.	+00001765.	-00000031.
+0039.00	+00000036.	+00001821.	-00000033.
+0039.50	+00000039.	+00001877.	-00000034.

TABLE I

T SEC	X M	Y M	Z M
+0040.00	+00000042.	+00001935.	-00000035.
+0040.50	+00000045.	+00001994.	-00000037.
+0041.00	+00000048.	+00002054.	-00000038.
+0041.50	+00000050.	+00002116.	-00000041.
+0042.00	+00000054.	+00002178.	-00000042.
+0042.50	+00000058.	+00002242.	-00000043.
+0043.00	+00000062.	+00002306.	-00000045.
+0043.50	+00000067.	+00002372.	-00000047.
+0044.00	+00000072.	+00002439.	-00000048.
+0044.50	+00000077.	+00002507.	-00000050.
+0045.00	+00000082.	+00002577.	-00000051.
+0045.50	+00000088.	+00002647.	-00000053.
+0046.00	+00000094.	+00002719.	-00000054.
+0046.50	+00000100.	+00002793.	-00000056.
+0047.00	+00000106.	+00002867.	-00000057.
+0047.50	+00000113.	+00002943.	-00000059.
+0048.00	+00000120.	+00003020.	-00000060.
+0048.50	+00000128.	+00003098.	-00000062.
+0049.00	+00000136.	+00003178.	-00000063.
+0049.50	+00000145.	+00003259.	-00000065.
+0050.00	+00000153.	+00003341.	-00000067.
+0050.50	+00000162.	+00003425.	-00000068.
+0051.00	+00000172.	+00003510.	-00000070.
+0051.50	+00000182.	+00003597.	-00000072.
+0052.00	+00000193.	+00003684.	-00000073.
+0052.50	+00000204.	+00003774.	-00000075.
+0053.00	+00000216.	+00003864.	-00000076.
+0053.50	+00000228.	+00003956.	-00000078.
+0054.00	+00000241.	+00004050.	-00000079.
+0054.50	+00000254.	+00004145.	-00000081.
+0055.00	+00000268.	+00004242.	-00000082.
+0055.50	+00000283.	+00004340.	-00000084.
+0056.00	+00000298.	+00004439.	-00000085.
+0056.50	+00000313.	+00004540.	-00000087.
+0057.00	+00000330.	+00004643.	-00000088.
+0057.50	+00000347.	+00004747.	-00000089.
+0058.00	+00000365.	+00004852.	-00000091.
+0058.50	+00000383.	+00004960.	-00000093.
+0059.00	+00000402.	+00005068.	-00000094.
+0059.50	+00000422.	+00005179.	-00000096.

TABLE I

T SEC	X M	Y M	Z M
+0060.00	+00000442.	+00005291.	-00000097.
+0060.50	+00000464.	+00005404.	-00000099.
+0061.00	+00000486.	+00005519.	-00000100.
+0061.50	+00000508.	+00005636.	-00000102.
+0062.00	+00000532.	+00005755.	-00000103.
+0062.50	+00000556.	+00005875.	-00000105.
+0063.00	+00000582.	+00005996.	-00000106.
+0063.50	+00000607.	+00006120.	-00000108.
+0064.00	+00000635.	+00006245.	-00000109.
+0064.50	+00000663.	+00006371.	-00000111.
+0065.00	+00000692.	+00006500.	-00000112.
+0065.50	+00000722.	+00006630.	-00000114.
+0066.00	+00000753.	+00006762.	-00000115.
+0066.50	+00000785.	+00006896.	-00000117.
+0067.00	+00000818.	+00007031.	-00000118.
+0067.50	+00000852.	+00007168.	-00000120.
+0068.00	+00000888.	+00007307.	-00000121.
+0068.50	+00000924.	+00007447.	-00000123.
+0069.00	+00000961.	+00007590.	-00000125.
+0069.50	+00001000.	+00007734.	-00000126.
+0070.00	+00001040.	+00007880.	-00000128.
+0070.50	+00001080.	+00008027.	-00000129.
+0071.00	+00001122.	+00008177.	-00000131.
+0071.50	+00001165.	+00008328.	-00000133.
+0072.00	+00001209.	+00008480.	-00000135.
+0072.50	+00001255.	+00008635.	-00000136.
+0073.00	+00001302.	+00008791.	-00000138.
+0073.50	+00001350.	+00008949.	-00000139.
+0074.00	+00001400.	+00009108.	-00000141.
+0074.50	+00001451.	+00009270.	-00000143.
+0075.00	+00001504.	+00009433.	-00000145.
+0075.50	+00001557.	+00009597.	-00000146.
+0076.00	+00001612.	+00009764.	-00000148.
+0076.50	+00001669.	+00009932.	-00000150.
+0077.00	+00001727.	+00010102.	-00000151.
+0077.50	+00001786.	+00010274.	-00000153.
+0078.00	+00001847.	+00010448.	-00000154.
+0078.50	+00001909.	+00010624.	-00000156.
+0079.00	+00001973.	+00010801.	-00000157.
+0079.50	+00002039.	+00010980.	-00000158.

TABLE I

T SEC	X M	Y M	Z M
+0080.00	+00002106.	+00011162.	-00000160.
+0080.50	+00002174.	+00011345.	-00000161.
+0081.00	+00002245.	+00011530.	-00000162.
+0081.50	+00002317.	+00011718.	-00000163.
+0082.00	+00002391.	+00011907.	-00000164.
+0082.50	+00002467.	+00012098.	-00000165.
+0083.00	+00002544.	+00012291.	-00000165.
+0083.50	+00002624.	+00012487.	-00000166.
+0084.00	+00002705.	+00012684.	-00000166.
+0084.50	+00002788.	+00012884.	-00000167.
+0085.00	+00002873.	+00013086.	-00000167.
+0085.50	+00002960.	+00013291.	-00000167.
+0086.00	+00003049.	+00013497.	-00000167.
+0086.50	+00003139.	+00013706.	-00000166.
+0087.00	+00003232.	+00013917.	-00000166.
+0087.50	+00003326.	+00014131.	-00000165.
+0088.00	+00003423.	+00014347.	-00000165.
+0088.50	+00003522.	+00014565.	-00000164.
+0089.00	+00003623.	+00014786.	-00000163.
+0089.50	+00003725.	+00015009.	-00000163.
+0090.00	+00003831.	+00015235.	-00000162.
+0090.50	+00003938.	+00015463.	-00000161.
+0091.00	+00004049.	+00015693.	-00000161.
+0091.50	+00004161.	+00015927.	-00000160.
+0092.00	+00004276.	+00016163.	-00000160.
+0092.50	+00004393.	+00016401.	-00000159.
+0093.00	+00004513.	+00016643.	-00000158.
+0093.50	+00004635.	+00016887.	-00000157.
+0094.00	+00004760.	+00017134.	-00000156.
+0094.50	+00004887.	+00017384.	-00000156.
+0095.00	+00005017.	+00017638.	-00000154.
+0095.50	+00005150.	+00017893.	-00000153.
+0096.00	+00005286.	+00018152.	-00000152.
+0096.50	+00005424.	+00018414.	-00000151.
+0097.00	+00005566.	+00018678.	-00000151.
+0097.50	+00005710.	+00018946.	-00000149.
+0098.00	+00005858.	+00019217.	-00000148.
+0098.50	+00006008.	+00019491.	-00000146.
+0099.00	+00006162.	+00019768.	-00000146.
+0099.50	+00006319.	+00020049.	-00000145.

TABLE I

T SEC	X M	Y M	Z M
+0100.00	+00006478.	+00020333.	-00000143.
+0100.50	+00006641.	+00020620.	-00000142.
+0101.00	+00006808.	+00020910.	-00000140.
+0101.50	+00006977.	+00021204.	-00000139.
+0102.00	+00007150.	+00021502.	-00000139.
+0102.50	+00007325.	+00021803.	-00000137.
+0103.00	+00007504.	+00022109.	-00000136.
+0103.50	+00007687.	+00022417.	-00000135.
+0104.00	+00007873.	+00022729.	-00000135.
+0104.50	+00008063.	+00023045.	-00000134.
+0105.00	+00008256.	+00023364.	-00000133.
+0105.50	+00008452.	+00023688.	-00000132.
+0106.00	+00008654.	+00024015.	-00000131.
+0106.50	+00008860.	+00024345.	-00000130.
+0107.00	+00009069.	+00024680.	-00000130.
+0107.50	+00009282.	+00025018.	-00000129.
+0108.00	+00009499.	+00025360.	-00000128.
+0108.50	+00009721.	+00025706.	-00000127.
+0109.00	+00009948.	+00026056.	-00000126.
+0109.50	+00010179.	+00026410.	-00000124.
+0110.00	+00010413.	+00026768.	-00000123.
+0110.50	+00010652.	+00027131.	-00000122.
+0111.00	+00010897.	+00027497.	-00000120.
+0111.50	+00011145.	+00027868.	-00000119.
+0112.00	+00011398.	+00028242.	-00000117.
+0112.50	+00011655.	+00028622.	-00000115.
+0113.00	+00011917.	+00029006.	-00000114.
+0113.50	+00012183.	+00029394.	-00000112.
+0114.00	+00012455.	+00029786.	-00000110.
+0114.50	+00012731.	+00030184.	-00000108.
+0115.00	+00013013.	+00030585.	-00000105.
+0115.50	+00013299.	+00030991.	-00000103.
+0116.00	+00013592.	+00031402.	-00000100.
+0116.50	+00013889.	+00031817.	-00000098.
+0117.00	+00014191.	+00032237.	-00000095.
+0117.50	+00014498.	+00032662.	-00000092.
+0118.00	+00014810.	+00033092.	-00000089.
+0118.50	+00015128.	+00033527.	-00000086.
+0119.00	+00015453.	+00033967.	-00000083.
+0119.50	+00015781.	+00034412.	-00000080.

TABLE I

T SEC	X M	Y M	Z M
+0120.00	+00016115.	+00034862.	-00000077.
+0120.50	+00016456.	+00035316.	-00000073.
+0121.00	+00016802.	+00035776.	-00000070.
+0121.50	+00017154.	+00036242.	-00000067.
+0122.00	+00017513.	+00036712.	-00000063.
+0122.50	+00017877.	+00037188.	-00000059.
+0123.00	+00018247.	+00037669.	-00000056.
+0123.50	+00018624.	+00038155.	-00000052.
+0124.00	+00019006.	+00038648.	-00000048.
+0124.50	+00019394.	+00039146.	-00000044.
+0125.00	+00019789.	+00039649.	-00000040.
+0125.50	+00020191.	+00040158.	-00000036.
+0126.00	+00020598.	+00040673.	-00000031.
+0126.50	+00021014.	+00041193.	-00000027.
+0127.00	+00021434.	+00041721.	-00000022.
+0127.50	+00021863.	+00042252.	-00000018.
+0128.00	+00022298.	+00042791.	-00000013.
+0128.50	+00022741.	+00043335.	-00000009.
+0129.00	+00023191.	+00043885.	-00000003.
+0129.50	+00023647.	+00044442.	+00000002.
+0130.00	+00024110.	+00045005.	+00000007.
+0130.50	+00024581.	+00045574.	+00000012.
+0131.00	+00025061.	+00046149.	+00000017.
+0131.50	+00025546.	+00046731.	+00000022.
+0132.00	+00026040.	+00047319.	+00000027.
+0132.50	+00026541.	+00047915.	+00000033.
+0133.00	+00027049.	+00048517.	+00000038.
+0133.50	+00027566.	+00049126.	+00000044.
+0134.00	+00028091.	+00049741.	+00000049.
+0134.50	+00028625.	+00050363.	+00000056.
+0135.00	+00029164.	+00050994.	+00000062.
+0135.50	+00029714.	+00051631.	+00000068.
+0136.00	+00030270.	+00052276.	+00000074.
+0136.50	+00030837.	+00052927.	+00000080.
+0137.00	+00031411.	+00053587.	+00000086.
+0137.50	+00031993.	+00054254.	+00000093.
+0138.00	+00032584.	+00054930.	+00000099.
+0138.50	+00033185.	+00055612.	+00000106.
+0139.00	+00033793.	+00056303.	+00000112.
+0139.50	+00034412.	+00057002.	+00000119.

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TABLE I

T SEC	X M	Y M	Z M
+0140.00	+00035038.	+00057709.	+00000126.
+0140.50	+00035674.	+00058425.	+00000134.
+0141.00	+00036321.	+00059149.	+00000141.
+0141.50	+00036976.	+00059881.	+00000148.
+0142.00	+00037641.	+00060622.	+00000155.
+0142.50	+00038309.	+00061372.	+00000165.
+0143.00	+00038986.	+00062120.	+00000171.
+0143.50	+00039663.	+00062867.	+00000179.
+0144.00	+00040338.	+00063615.	+00000186.
+0144.50	+00041016.	+00064359.	+00000195.
+0145.00	+00041693.	+00065102.	+00000202.
+0150.00	+00048468.	+00072400.	+00000280.
+0155.00	+00055235.	+00079459.	+00000363.
+0160.00	+00061992.	+00086281.	+00000448.
+0165.00	+00068746.	+00092865.	+00000537.
+0170.00	+00075486.	+00099221.	+00000631.
+0175.00	+00082218.	+00105336.	+00000726.
+0180.00	+00088940.	+00111218.	+00000822.
+0185.00	+00095648.	+00116874.	+00000922.
+0190.00	+00102347.	+00122303.	+00001022.
+0195.00	+00109038.	+00127501.	+00001127.
+0200.00	+00115726.	+00132466.	+00001235.
+0205.00	+00122406.	+00137201.	+00001345.
+0210.00	+00129081.	+00141702.	+00001458.
+0215.00	+00135743.	+00145978.	+00001576.
+0220.00	+00142402.	+00150019.	+00001694.
+0225.00	+00149047.	+00153838.	+00001815.
+0230.00	+00155684.	+00157428.	+00001942.
+0235.00	+00162317.	+00160785.	+00002069.
+0240.00	+00168947.	+00163910.	+00002199.
+0245.00	+00175558.	+00166818.	+00002335.
+0250.00	+00182166.	+00169496.	+00002469.
+0255.00	+00188764.	+00171947.	+00002609.
+0260.00	+00195358.	+00174168.	+00002748.
+0265.00	+00201941.	+00176165.	+00002892.
+0270.00	+00208497.	+00177959.	+00003051.
+0275.00	+00215061.	+00179510.	+00003178.
+0280.00	+00221621.	+00180830.	+00003330.
+0285.00	+00228172.	+00181925.	+00003480.
+0290.00	+00234717.	+00182792.	+00003627.

TABLE I

T SEC	X M	Y M	Z M
+0295.00	+00241254.	+00183432.	+00003782.
+0300.00	+00247776.	+00183856.	+00003937.
+0305.00	+00254293.	+00184050.	+00004095.
+0310.00	+00260803.	+00184015.	+00004258.
+0315.00	+00267305.	+00183757.	+00004421.
+0320.00	+00273811.	+00183252.	+00004589.
+0325.00	+00280292.	+00182539.	+00004759.
+0330.00	+00286763.	+00181598.	+00004924.
+0335.00	+00293227.	+00180432.	+00005094.
+0340.00	+00299679.	+00179057.	+00005270.
+0345.00	+00306120.	+00177467.	+00005453.
+0350.00	+00312567.	+00175627.	+00005635.
+0355.00	+00319011.	+00173553.	+00005815.
+0360.00	+00325436.	+00171276.	+00005994.
+0365.00	+00331859.	+00168760.	+00006184.
+0370.00	+00338273.	+00166020.	+00006365.
+0375.00	+00344679.	+00163048.	+00006551.
+0380.00	+00351083.	+00159837.	+00006746.
+0385.00	+00357477.	+00156398.	+00006930.
+0390.00	+00363858.	+00152739.	+00007123.
+0395.00	+00370235.	+00148835.	+00007314.
+0400.00	+00376592.	+00144726.	+00007507.
+0405.00	+00382941.	+00140385.	+00007707.
+0410.00	+00389281.	+00135818.	+00007899.
+0415.00	+00395611.	+00131033.	+00008103.
+0420.00	+00401946.	+00125980.	+00008305.
+0425.00	+00408262.	+00120726.	+00008509.
+0430.00	+00414579.	+00115204.	+00008704.
+0435.00	+00420871.	+00109516.	+00008910.
+0440.00	+00427161.	+00103577.	+00009114.
+0445.00	+00433464.	+00097307.	+00009368.
+0450.00	+00439742.	+00090911.	+00009580.
+0455.00	+00446005.	+00084257.	+00009790.
+0460.00	+00452224.	+00077420.	+00009995.

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19

TABLE I

T SEC	X M	Y M	Z M
465.00	458414.3	70414.44	10204.63
470.00	464592.3	63164.88	10416.07
475.00	470755.0	55684.25	10628.41
478.50	475054.0	50317.38	10777.27
480.00	476896.7	47979.31	10841.29
485.00	483003.5	40067.13	11054.28
490.00	489044.6	31988.81	11266.22
495.00	494943.5	23849.81	11474.35
500.00	500492.8	15947.19	11671.26
507.74	507264.8	5841.06	11917.79
510.00	508617.1	3709.56	11972.12
515.00	510671.8	275.06	12058.82
520.00	511840.5	-1945.25	12118.51
525.00	512515.8	-3490.69	12161.69
530.00	512925.1	-4697.31	12196.22
535.00	513178.8	-5726.69	12220.85
540.00	513325.5	-6634.69	12240.04
545.00	513404.5	-7458.06	12259.53
550.00	513440.6	-8218.56	12281.06
555.00	513446.4	-8930.25	12302.77
560.00	513427.6	-9602.81	12320.79
565.00	513391.5	-10243.25	12336.99
570.00	513345.6	-10856.13	12352.24
575.00	513292.1	-11445.00	12365.64
580.00	513231.3	-12013.00	12376.98
585.00	513165.2	-12562.06	12385.68
590.00	513098.2	-13093.44	12391.40
595.00	513031.1	-13608.75	12392.51
600.00	512963.9	-14109.50	12390.39
605.00	512898.2	-14596.38	12386.44
610.00	512835.6	-15070.19	12380.00
615.00	512774.6	-15532.00	12370.18
620.00	512716.9	-15982.13	12355.46
625.00	512665.6	-16421.00	12335.88
630.00	512618.7	-16849.63	12314.82
635.00	512572.8	-17268.94	12294.66
640.00	512526.9	-17679.25	12274.64
645.00	512480.0	-18080.94	12250.86
650.00	512431.4	-18474.50	12220.73
655.00	512382.5	-18859.88	12185.45
660.00	512335.3	-19237.69	12148.68

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TABLE I

T SEC	X M	Y M	Z M
665.00	512288.7	-19608.50	12113.15
670.00	512241.0	-19972.75	12080.22
675.00	512190.2	-20331.00	12050.08
678.75	512150.2	-20596.00	12029.74

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BOOSTER

TABLE II B

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0000.00	+00000.000	-00000.000	+00000.005	+0000000.2
+0000.50	-00000.000	-00000.000	+00000.000	+0000000.0
+0001.00	+00000.000	-00000.000	+00000.005	+0000000.2
+0001.50	+00000.000	-00000.000	+00000.005	+0000000.2
+0002.00	-00000.000	-00000.000	+00000.006	+0000000.3
+0002.50	+00000.000	+00000.002	+00000.017	+0000002.1
+0003.00	+00000.000	+00000.005	+00000.023	+0000003.7
+0003.50	+00000.000	+00000.009	+00000.023	+0000003.8
+0004.00	+00000.000	+00000.013	+00000.021	+0000003.2
+0004.50	+00000.000	+00000.016	+00000.021	+0000003.3
+0005.00	+00000.001	+00000.020	+00000.024	+0000004.1
+0005.50	+00000.001	+00000.024	+00000.027	+0000005.2
+0006.00	+00000.001	+00000.029	+00000.030	+0000006.3
+0006.50	+00000.001	+00000.034	+00000.032	+0000007.5
+0007.00	+00000.001	+00000.040	+00000.035	+0000008.9
+0007.50	+00000.001	+00000.046	+00000.038	+0000010.6
+0008.00	+00000.001	+00000.053	+00000.041	+0000012.3
+0008.50	+00000.001	+00000.060	+00000.044	+0000014.2
+0009.00	+00000.001	+00000.068	+00000.047	+0000016.2
+0009.50	+00000.002	+00000.076	+00000.050	+0000018.4
+0010.00	+00000.002	+00000.085	+00000.054	+0000020.7
+0010.50	+00000.002	+00000.094	+00000.057	+0000023.2
+0011.00	+00000.002	+00000.104	+00000.060	+0000025.8
+0011.50	+00000.002	+00000.115	+00000.063	+0000028.7
+0012.00	+00000.002	+00000.126	+00000.067	+0000031.9
+0012.50	+00000.003	+00000.137	+00000.070	+0000035.2
+0013.00	+00000.003	+00000.150	+00000.074	+0000038.8
+0013.50	+00000.003	+00000.162	+00000.077	+0000042.5
+0014.00	+00000.003	+00000.176	+00000.081	+0000046.5
+0014.50	+00000.003	+00000.190	+00000.084	+0000050.6
+0015.00	+00000.003	+00000.205	+00000.088	+0000055.1
+0015.50	+00000.004	+00000.220	+00000.092	+0000059.7
+0016.00	+00000.004	+00000.236	+00000.096	+0000064.6
+0016.50	+00000.004	+00000.253	+00000.099	+0000069.8
+0017.00	+00000.004	+00000.270	+00000.103	+0000075.0
+0017.50	+00000.004	+00000.288	+00000.107	+0000080.4
+0018.00	+00000.005	+00000.306	+00000.111	+0000086.2
+0018.50	+00000.005	+00000.326	+00000.115	+0000092.2
+0019.00	+00000.005	+00000.346	+00000.119	+0000098.4
+0019.50	+00000.005	+00000.366	+00000.123	+0000105.0

TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0020.00	+00000.005	+00000.388	+00000.127	+0000111.8
+0020.50	+00000.005	+00000.410	+00000.131	+0000119.0
+0021.00	+00000.006	+00000.432	+00000.135	+0000126.4
+0021.50	+00000.006	+00000.456	+00000.139	+0000134.2
+0022.00	+00000.006	+00000.480	+00000.144	+0000142.3
+0022.50	+00000.006	+00000.505	+00000.148	+0000150.7
+0023.00	+00000.006	+00000.531	+00000.153	+0000159.4
+0023.50	+00000.006	+00000.558	+00000.157	+0000168.5
+0024.00	+00000.007	+00000.585	+00000.162	+0000177.8
+0024.50	+00000.007	+00000.613	+00000.166	+0000187.5
+0025.00	+00000.007	+00000.642	+00000.171	+0000197.6
+0025.50	+00000.007	+00000.672	+00000.176	+0000207.9
+0026.00	+00000.007	+00000.703	+00000.180	+0000218.6
+0026.50	+00000.008	+00000.734	+00000.185	+0000229.7
+0027.00	+00000.008	+00000.766	+00000.190	+0000241.1
+0027.50	+00000.008	+00000.799	+00000.195	+0000253.0
+0028.00	+00000.008	+00000.833	+00000.200	+0000265.3
+0028.50	+00000.009	+00000.868	+00000.205	+0000278.1
+0029.00	+00000.009	+00000.904	+00000.211	+0000291.2
+0029.50	+00000.010	+00000.940	+00000.216	+0000304.8
+0030.00	+00000.010	+00000.978	+00000.221	+0000318.9
+0030.50	+00000.011	+00001.016	+00000.227	+0000333.4
+0031.00	+00000.012	+00001.056	+00000.232	+0000348.3
+0031.50	+00000.012	+00001.096	+00000.238	+0000363.6
+0032.00	+00000.013	+00001.137	+00000.244	+0000379.3
+0032.50	+00000.014	+00001.179	+00000.249	+0000395.4
+0033.00	+00000.015	+00001.223	+00000.255	+0000412.0
+0033.50	+00000.016	+00001.267	+00000.261	+0000429.0
+0034.00	+00000.017	+00001.312	+00000.267	+0000446.4
+0034.50	+00000.019	+00001.358	+00000.273	+0000464.1
+0035.00	+00000.020	+00001.405	+00000.279	+0000482.3
+0035.50	+00000.021	+00001.454	+00000.285	+0000500.8
+0036.00	+00000.023	+00001.503	+00000.291	+0000519.7
+0036.50	+00000.025	+00001.553	+00000.298	+0000539.1
+0037.00	+00000.027	+00001.605	+00000.304	+0000558.9
+0037.50	+00000.029	+00001.657	+00000.310	+0000579.1
+0038.00	+00000.031	+00001.710	+00000.317	+0000599.6
+0038.50	+00000.033	+00001.765	+00000.323	+0000620.6
+0039.00	+00000.036	+00001.821	+00000.330	+0000642.3
+0039.50	+00000.038	+00001.877	+00000.337	+0000664.3

TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0040.00	+00000.041	+00001.935	+00000.343	+0000686.8
+0040.50	+00000.044	+00001.994	+00000.350	+0000709.7
+0041.00	+00000.047	+00002.054	+00000.357	+0000733.1
+0041.50	+00000.051	+00002.115	+00000.364	+0000757.0
+0042.00	+00000.054	+00002.178	+00000.372	+0000781.2
+0042.50	+00000.058	+00002.241	+00000.379	+0000805.8
+0043.00	+00000.063	+00002.306	+00000.386	+0000830.6
+0043.50	+00000.067	+00002.372	+00000.393	+0000855.7
+0044.00	+00000.072	+00002.439	+00000.401	+0000881.2
+0044.50	+00000.077	+00002.507	+00000.408	+0000907.0
+0045.00	+00000.082	+00002.577	+00000.416	+0000933.2
+0045.50	+00000.088	+00002.647	+00000.423	+0000959.7
+0046.00	+00000.093	+00002.719	+00000.431	+0000986.6
+0046.50	+00000.100	+00002.792	+00000.439	+0001013.6
+0047.00	+00000.106	+00002.867	+00000.447	+0001040.9
+0047.50	+00000.113	+00002.943	+00000.455	+0001068.5
+0048.00	+00000.120	+00003.020	+00000.463	+0001096.6
+0048.50	+00000.128	+00003.098	+00000.471	+0001125.5
+0049.00	+00000.136	+00003.178	+00000.480	+0001154.7
+0049.50	+00000.144	+00003.259	+00000.488	+0001184.2
+0050.00	+00000.153	+00003.341	+00000.497	+0001214.8
+0050.50	+00000.162	+00003.425	+00000.506	+0001245.9
+0051.00	+00000.172	+00003.510	+00000.515	+0001277.3
+0051.50	+00000.182	+00003.596	+00000.524	+0001309.1
+0052.00	+00000.193	+00003.684	+00000.533	+0001341.3
+0052.50	+00000.204	+00003.774	+00000.542	+0001374.0
+0053.00	+00000.216	+00003.864	+00000.552	+0001407.8
+0053.50	+00000.228	+00003.956	+00000.562	+0001441.8
+0054.00	+00000.241	+00004.050	+00000.572	+0001475.7
+0054.50	+00000.254	+00004.145	+00000.582	+0001509.6
+0055.00	+00000.268	+00004.242	+00000.592	+0001543.7
+0055.50	+00000.282	+00004.340	+00000.602	+0001576.7
+0056.00	+00000.297	+00004.439	+00000.612	+0001609.6
+0056.50	+00000.313	+00004.540	+00000.622	+0001642.7
+0057.00	+00000.329	+00004.643	+00000.632	+0001676.2
+0057.50	+00000.346	+00004.747	+00000.642	+0001709.4
+0058.00	+00000.364	+00004.852	+00000.653	+0001743.9
+0058.50	+00000.382	+00004.960	+00000.664	+0001778.3
+0059.00	+00000.401	+00005.068	+00000.675	+0001812.8
+0059.50	+00000.421	+00005.179	+00000.686	+0001847.5

TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0060.00	+00000.442	+00005.291	+00000.698	+0001882.3
+0060.50	+00000.463	+00005.404	+00000.709	+0001917.8
+0061.00	+00000.485	+00005.519	+00000.721	+0001953.1
+0061.50	+00000.508	+00005.636	+00000.733	+0001988.3
+0062.00	+00000.531	+00005.754	+00000.745	+0002023.1
+0062.50	+00000.556	+00005.874	+00000.757	+0002056.5
+0063.00	+00000.581	+00005.996	+00000.769	+0002089.3
+0063.50	+00000.607	+00006.120	+00000.781	+0002124.0
+0064.00	+00000.634	+00006.245	+00000.794	+0002158.0
+0064.50	+00000.662	+00006.371	+00000.807	+0002192.9
+0065.00	+00000.691	+00006.500	+00000.820	+0002227.1
+0065.50	+00000.721	+00006.630	+00000.833	+0002259.4
+0066.00	+00000.752	+00006.762	+00000.846	+0002290.4
+0066.50	+00000.784	+00006.896	+00000.859	+0002318.8
+0067.00	+00000.817	+00007.031	+00000.872	+0002347.1
+0067.50	+00000.851	+00007.168	+00000.885	+0002374.2
+0068.00	+00000.886	+00007.307	+00000.898	+0002401.4
+0068.50	+00000.923	+00007.448	+00000.912	+0002430.4
+0069.00	+00000.960	+00007.590	+00000.925	+0002456.7
+0069.50	+00000.998	+00007.734	+00000.939	+0002480.7
+0070.00	+00001.038	+00007.880	+00000.953	+0002504.9
+0070.50	+00001.079	+00008.027	+00000.967	+0002528.2
+0071.00	+00001.120	+00008.176	+00000.981	+0002552.2
+0071.50	+00001.164	+00008.327	+00000.996	+0002574.8
+0072.00	+00001.208	+00008.480	+00001.010	+0002596.3
+0072.50	+00001.254	+00008.634	+00001.026	+0002620.3
+0073.00	+00001.300	+00008.791	+00001.042	+0002643.8
+0073.50	+00001.349	+00008.948	+00001.058	+0002668.3
+0074.00	+00001.398	+00009.108	+00001.074	+0002691.2
+0074.50	+00001.449	+00009.269	+00001.091	+0002711.8
+0075.00	+00001.501	+00009.432	+00001.107	+0002728.1
+0075.50	+00001.555	+00009.597	+00001.123	+0002745.1
+0076.00	+00001.610	+00009.764	+00001.140	+0002761.4
+0076.50	+00001.666	+00009.932	+00001.157	+0002776.2
+0077.00	+00001.724	+00010.102	+00001.174	+0002790.4
+0077.50	+00001.783	+00010.274	+00001.192	+0002804.8
+0078.00	+00001.844	+00010.448	+00001.211	+0002822.9
+0078.50	+00001.906	+00010.624	+00001.230	+0002838.6
+0079.00	+00001.970	+00010.801	+00001.249	+0002852.7
+0079.50	+00002.035	+00010.980	+00001.269	+0002866.6

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TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0080.00	+00002.102	+00011.162	+00001.289	+0002877.9
+0080.50	+00002.171	+00011.345	+00001.309	+0002890.1
+0081.00	+00002.241	+00011.530	+00001.331	+0002903.1
+0081.50	+00002.313	+00011.718	+00001.353	+0002914.2
+0082.00	+00002.387	+00011.907	+00001.375	+0002923.5
+0082.50	+00002.462	+00012.098	+00001.397	+0002931.7
+0083.00	+00002.540	+00012.292	+00001.421	+0002939.6
+0083.50	+00002.619	+00012.487	+00001.445	+0002948.5
+0084.00	+00002.699	+00012.685	+00001.470	+0002959.3
+0084.50	+00002.782	+00012.885	+00001.496	+0002966.8
+0085.00	+00002.867	+00013.087	+00001.522	+0002972.4
+0085.50	+00002.953	+00013.291	+00001.549	+0002979.8
+0086.00	+00003.042	+00013.498	+00001.577	+0002985.3
+0086.50	+00003.132	+00013.707	+00001.601	+0002973.3
+0087.00	+00003.224	+00013.918	+00001.623	+0002952.1
+0087.50	+00003.319	+00014.131	+00001.646	+0002934.0
+0088.00	+00003.415	+00014.347	+00001.673	+0002923.7
+0088.50	+00003.513	+00014.565	+00001.701	+0002913.3
+0089.00	+00003.614	+00014.786	+00001.725	+0002889.9
+0089.50	+00003.717	+00015.010	+00001.746	+0002851.3
+0090.00	+00003.822	+00015.235	+00001.769	+0002819.3
+0090.50	+00003.929	+00015.464	+00001.783	+0002758.4
+0091.00	+00004.039	+00015.694	+00001.802	+0002710.4
+0091.50	+00004.151	+00015.928	+00001.825	+0002672.8
+0092.00	+00004.265	+00016.164	+00001.849	+0002639.5
+0092.50	+00004.382	+00016.403	+00001.878	+0002616.7
+0093.00	+00004.501	+00016.645	+00001.907	+0002592.7
+0093.50	+00004.623	+00016.889	+00001.932	+0002553.7
+0094.00	+00004.747	+00017.136	+00001.952	+0002501.7
+0094.50	+00004.874	+00017.386	+00001.973	+0002453.8
+0095.00	+00005.004	+00017.639	+00001.997	+0002410.1
+0095.50	+00005.136	+00017.895	+00002.021	+0002368.1
+0096.00	+00005.271	+00018.154	+00002.047	+0002328.2
+0096.50	+00005.409	+00018.416	+00002.073	+0002288.5
+0097.00	+00005.550	+00018.680	+00002.098	+0002246.1
+0097.50	+00005.694	+00018.948	+00002.126	+0002207.5
+0098.00	+00005.840	+00019.219	+00002.154	+0002169.5
+0098.50	+00005.990	+00019.494	+00002.181	+0002130.1
+0099.00	+00006.143	+00019.771	+00002.206	+0002084.7
+0099.50	+00006.299	+00020.052	+00002.210	+0002000.9

TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0100.00	+00006.457	+00020.336	+00002.235	+0001955.9
+0100.50	+00006.619	+00020.624	+00002.262	+0001915.3
+0101.00	+00006.785	+00020.914	+00002.286	+0001868.9
+0101.50	+00006.953	+00021.209	+00002.311	+0001823.5
+0102.00	+00007.124	+00021.507	+00002.339	+0001782.5
+0102.50	+00007.299	+00021.808	+00002.371	+0001749.1
+0103.00	+00007.478	+00022.113	+00002.410	+0001723.4
+0103.50	+00007.659	+00022.422	+00002.461	+0001712.2
+0104.00	+00007.845	+00022.734	+00002.492	+0001673.1
+0104.50	+00008.033	+00023.050	+00002.517	+0001625.7
+0105.00	+00008.226	+00023.369	+00002.536	+0001571.3
+0105.50	+00008.422	+00023.693	+00002.565	+0001530.0
+0106.00	+00008.622	+00024.020	+00002.600	+0001496.6
+0106.50	+00008.826	+00024.351	+00002.641	+0001468.2
+0107.00	+00009.034	+00024.686	+00002.677	+0001434.0
+0107.50	+00009.246	+00025.024	+00002.707	+0001393.4
+0108.00	+00009.463	+00025.367	+00002.741	+0001356.4
+0108.50	+00009.683	+00025.713	+00002.781	+0001324.4
+0109.00	+00009.908	+00026.064	+00002.826	+0001297.4
+0109.50	+00010.136	+00026.418	+00002.871	+0001268.8
+0110.00	+00010.370	+00026.777	+00002.907	+0001231.3
+0110.50	+00010.607	+00027.139	+00002.929	+0001184.1
+0111.00	+00010.849	+00027.506	+00002.957	+0001142.5
+0111.50	+00011.096	+00027.877	+00002.993	+0001108.5
+0112.00	+00011.347	+00028.253	+00003.027	+0001072.1
+0112.50	+00011.602	+00028.632	+00003.069	+0001042.6
+0113.00	+00011.863	+00029.017	+00003.099	+0001004.9
+0113.50	+00012.128	+00029.405	+00003.135	+0000971.7
+0114.00	+00012.397	+00029.798	+00003.163	+0000934.8
+0114.50	+00012.672	+00030.196	+00003.210	+0000909.1
+0115.00	+00012.951	+00030.598	+00003.262	+0000885.4
+0115.50	+00013.236	+00031.005	+00003.302	+0000855.5
+0116.00	+00013.525	+00031.416	+00003.347	+0000828.1
+0116.50	+00013.819	+00031.832	+00003.397	+0000803.6
+0117.00	+00014.119	+00032.253	+00003.445	+0000777.9
+0117.50	+00014.424	+00032.679	+00003.449	+0000733.7
+0118.00	+00014.734	+00033.109	+00003.468	+0000697.8
+0118.50	+00015.049	+00033.545	+00003.505	+0000669.9
+0119.00	+00015.370	+00033.985	+00003.542	+0000642.7
+0119.50	+00015.696	+00034.431	+00003.579	+0000616.8

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TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0120.00	+00016.028	+00034.881	+00003.617	+0000591.8
+0120.50	+00016.365	+00035.337	+00003.655	+0000567.4
+0121.00	+00016.708	+00035.798	+00003.693	+0000543.5
+0121.50	+00017.057	+00036.264	+00003.732	+0000520.2
+0122.00	+00017.412	+00036.736	+00003.771	+0000497.8
+0122.50	+00017.773	+00037.213	+00003.810	+0000476.6
+0123.00	+00018.139	+00037.695	+00003.850	+0000455.9
+0123.50	+00018.512	+00038.183	+00003.890	+0000435.8
+0124.00	+00018.890	+00038.676	+00003.930	+0000416.8
+0124.50	+00019.275	+00039.175	+00003.971	+0000398.4
+0125.00	+00019.667	+00039.679	+00004.012	+0000380.5
+0125.50	+00020.064	+00040.190	+00004.053	+0000363.1
+0126.00	+00020.468	+00040.706	+00004.095	+0000346.6
+0126.50	+00020.879	+00041.228	+00004.138	+0000330.9
+0127.00	+00021.296	+00041.755	+00004.180	+0000315.7
+0127.50	+00021.719	+00042.289	+00004.223	+0000301.0
+0128.00	+00022.150	+00042.829	+00004.266	+0000286.7
+0128.50	+00022.587	+00043.375	+00004.310	+0000272.8
+0129.00	+00023.031	+00043.926	+00004.354	+0000260.0
+0129.50	+00023.483	+00044.485	+00004.399	+0000247.8
+0130.00	+00023.941	+00045.049	+00004.444	+0000236.1
+0130.50	+00024.407	+00045.620	+00004.490	+0000224.7
+0131.00	+00024.880	+00046.197	+00004.536	+0000213.7
+0131.50	+00025.360	+00046.781	+00004.582	+0000203.1
+0132.00	+00025.847	+00047.372	+00004.587	+0000182.0
+0132.50	+00026.342	+00047.969	+00004.647	+0000173.8
+0133.00	+00026.845	+00048.573	+00004.707	+0000165.8
+0133.50	+00027.355	+00049.184	+00004.769	+0000158.0
+0134.00	+00027.873	+00049.802	+00004.831	+0000150.5
+0134.50	+00028.399	+00050.428	+00004.894	+0000143.2
+0135.00	+00028.933	+00051.060	+00004.958	+0000136.1
+0135.50	+00029.475	+00051.700	+00005.023	+0000129.3
+0136.00	+00030.024	+00052.347	+00005.088	+0000122.7
+0136.50	+00030.582	+00053.001	+00005.154	+0000125.9
+0137.00	+00031.148	+00053.664	+00005.249	+0000120.5
+0137.50	+00031.723	+00054.334	+00005.346	+0000115.1
+0138.00	+00032.305	+00055.012	+00005.447	+0000109.8
+0138.50	+00032.897	+00055.698	+00005.549	+0000104.6
+0139.00	+00033.497	+00056.392	+00005.654	+0000099.4
+0139.50	+00034.106	+00057.094	+00005.762	+0000094.4

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TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0140.00	+00034.723	+00057.805	+00005.873	+0000089.4
+0140.50	+00035.350	+00058.524	+00005.989	+0000084.5
+0141.00	+00035.986	+00059.251	+00006.106	+0000079.8
+0141.50	+00036.632	+00059.987	+00006.227	+0000075.1
+0142.00	+00037.284	+00060.733	+00006.341	+0000070.3
+0142.50	+00037.944	+00061.485	+00006.430	+0000065.1
+0143.00	+00038.610	+00062.238	+00006.478	+0000059.5
+0143.50	+00039.275	+00062.989	+00006.520	+0000054.1
+0144.00	+00039.939	+00063.740	+00006.564	+0000049.2
+0144.50	+00040.605	+00064.490	+00006.606	+0000044.6
+0145.00	+00041.271	+00065.237	+00006.643	+0000040.4
+0150.00	+00047.922	+00072.582	+00007.058	+0000013.8
+0155.00	+00054.553	+00079.696	+00007.509	+0000004.0
+0160.00	+00061.161	+00086.579	+00007.376	+0000000.9
+0165.00	+00067.754	+00093.232	+00007.247	+0000000.2
+0170.00	+00074.326	+00099.660	+00007.116	+0000000.1
+0175.00	+00080.878	+00105.857	+00006.986	+0000000.0
+0180.00	+00087.408	+00111.828	+00006.862	+0000000.0
+0185.00	+00093.917	+00117.579	+00006.742	+0000000.0
+0190.00	+00100.411	+00123.108	+00006.626	+0000000.0
+0195.00	+00106.890	+00128.414	+00006.513	+0000000.0
+0200.00	+00113.358	+00133.495	+00006.402	+0000000.0
+0205.00	+00119.813	+00138.350	+00006.294	+0000000.0
+0210.00	+00126.257	+00142.981	+00006.189	+0000000.0
+0215.00	+00132.686	+00147.390	+00006.087	+0000000.0
+0220.00	+00139.103	+00151.575	+00005.990	+0000000.0
+0225.00	+00145.509	+00155.540	+00005.896	+0000000.0
+0230.00	+00151.904	+00159.282	+00005.806	+0000000.0
+0235.00	+00158.293	+00162.799	+00005.722	+0000000.0
+0240.00	+00164.672	+00166.095	+00005.640	+0000000.0
+0245.00	+00171.040	+00169.174	+00005.563	+0000000.0
+0250.00	+00177.402	+00172.030	+00005.492	+0000000.0
+0255.00	+00183.757	+00174.666	+00005.425	+0000000.0
+0260.00	+00190.106	+00177.081	+00005.364	+0000000.0
+0265.00	+00196.450	+00179.276	+00005.304	+0000000.0
+0270.00	+00202.769	+00181.272	+00005.243	+0000000.0
+0275.00	+00209.091	+00183.042	+00005.210	+0000000.0
+0280.00	+00215.423	+00184.578	+00005.168	+0000000.0
+0285.00	+00221.747	+00185.901	+00005.132	+0000000.0
+0290.00	+00228.073	+00186.996	+00005.108	+0000000.0

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TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0295.00	+00234.397	+00187.873	+00005.079	+0000000.0
+0300.00	+00240.715	+00188.536	+00005.062	+0000000.0
+0305.00	+00247.033	+00188.979	+00005.050	+0000000.0
+0310.00	+00253.351	+00189.202	+00005.047	+0000000.0
+0315.00	+00259.674	+00189.200	+00005.052	+0000000.0
+0320.00	+00266.001	+00188.972	+00005.058	+0000000.0
+0325.00	+00272.324	+00188.527	+00005.062	+0000000.0
+0330.00	+00278.642	+00187.868	+00005.080	+0000000.0
+0335.00	+00284.964	+00186.992	+00005.104	+0000000.0
+0340.00	+00291.283	+00185.915	+00005.122	+0000000.0
+0345.00	+00297.607	+00184.622	+00005.175	+0000000.0
+0350.00	+00303.956	+00183.081	+00005.228	+0000000.0
+0355.00	+00310.304	+00181.331	+00005.259	+0000000.0
+0360.00	+00316.656	+00179.368	+00005.322	+0000000.0
+0365.00	+00323.022	+00177.174	+00005.379	+0000000.0
+0370.00	+00329.390	+00174.769	+00005.437	+0000000.0
+0375.00	+00335.771	+00172.132	+00005.523	+0000000.0
+0380.00	+00342.168	+00169.260	+00005.592	+0000000.0
+0385.00	+00348.568	+00166.177	+00005.664	+0000000.0
+0390.00	+00354.976	+00162.876	+00005.746	+0000000.0
+0395.00	+00361.394	+00159.349	+00005.833	+0000000.0
+0400.00	+00367.818	+00155.608	+00005.912	+0000000.0
+0405.00	+00374.254	+00151.642	+00006.022	+0000000.0
+0410.00	+00380.708	+00147.446	+00006.107	+0000000.0
+0415.00	+00387.169	+00143.045	+00006.215	+0000000.0
+0420.00	+00393.654	+00138.399	+00006.331	+0000000.0
+0425.00	+00400.151	+00133.538	+00006.428	+0000000.0
+0430.00	+00406.660	+00128.456	+00006.543	+0000000.0
+0435.00	+00413.184	+00123.159	+00006.654	+0000000.0
+0440.00	+00419.734	+00117.610	+00006.799	+0000000.0
+0445.00	+00426.302	+00111.837	+00006.901	+0000000.0
+0450.00	+00432.892	+00105.850	+00007.036	+0000000.0
+0455.00	+00439.486	+00099.651	+00007.115	+0000000.1
+0460.00	+00446.063	+00093.277	+00007.203	+0000000.2

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TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
465.00	452.707	86.688	7.320	1.0
470.00	459.308	79.898	7.434	3.8
475.00	465.925	72.884	6.947	12.2
478.50	470.560	67.846	6.661	25.1
480.00	472.552	65.651	6.548	33.6
485.00	479.175	58.216	6.200	83.3
490.00	485.761	50.617	5.997	196.4
495.00	492.227	42.954	6.044	541.8
500.00	498.342	35.506	5.881	1363.5
507.74	505.862	25.963	4.120	2687.0
510.00	507.375	23.946	3.424	2527.8
515.00	509.692	20.686	2.178	1706.6
520.00	511.033	18.566	1.420	1023.4
525.00	511.829	17.080	1.015	669.7
530.00	512.334	15.910	0.813	522.9
535.00	512.670	14.904	0.690	444.7
540.00	512.889	14.011	0.601	391.5
545.00	513.035	13.197	0.542	363.3
550.00	513.133	12.442	0.498	346.2
555.00	513.197	11.733	0.464	334.7
560.00	513.233	11.061	0.435	326.6
565.00	513.249	10.420	0.412	321.4
570.00	513.253	9.805	0.391	317.3
575.00	513.248	9.214	0.373	313.8
580.00	513.234	8.643	0.357	311.6
585.00	513.213	8.090	0.343	310.5
590.00	513.189	7.555	0.329	308.6
595.00	513.164	7.036	0.317	307.4
600.00	513.137	6.532	0.306	306.3
605.00	513.111	6.041	0.296	305.7
610.00	513.087	5.564	0.287	304.2
615.00	513.064	5.099	0.278	304.1
620.00	513.042	4.645	0.270	304.2
625.00	513.026	4.204	0.262	302.6
630.00	513.014	3.772	0.255	301.2
635.00	513.001	3.351	0.248	300.8
640.00	512.989	2.938	0.242	300.3
645.00	512.974	2.534	0.236	299.8
650.00	512.956	2.138	0.230	299.7
655.00	512.938	1.750	0.225	299.5
660.00	512.921	1.369	0.220	298.7

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31

TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
665.00	512.903	0.996	0.215	298.0
670.00	512.885	0.629	0.210	297.3
675.00	512.862	0.267	0.205	296.9
678.75	512.843	-0.000	0.203	299.5

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BOOSTER

TABLE III B

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0000.00	+000000.00	+00000.000	+00000.000	+00000.000
+0000.50	+000000.00	+00000.000	-00000.000	-00000.000
+0001.00	+000000.00	+00000.000	+00000.000	-00000.000
+0001.50	+000000.00	+00000.000	+00000.000	-00000.000
+0002.00	+000001.14	+00002.561	-00001.713	+00008.865
+0002.50	+000005.56	+00001.534	+00000.052	+00006.308
+0003.00	+000007.55	+00001.356	+00000.164	+00003.332
+0003.50	+000007.60	+00001.301	+00000.107	-00000.140
+0004.00	+000006.97	+00001.588	-00000.165	-00000.574
+0004.50	+000007.07	+00002.022	-00000.457	+00000.839
+0005.00	+000007.87	+00002.059	-00000.598	+00001.807
+0005.50	+000008.93	+00001.802	-00000.661	+00001.950
+0006.00	+000009.93	+00001.584	-00000.734	+00001.817
+0006.50	+000010.87	+00001.504	-00000.841	+00001.935
+0007.00	+000011.88	+00001.476	-00000.939	+00002.127
+0007.50	+000012.96	+00001.447	-00001.005	+00002.157
+0008.00	+000014.03	+00001.431	-00001.050	+00002.112
+0008.50	+000015.07	+00001.429	-00001.079	+00002.089
+0009.00	+000016.12	+00001.427	-00001.087	+00002.104
+0009.50	+000017.18	+00001.413	-00001.068	+00002.132
+0010.00	+000018.25	+00001.374	-00001.022	+00002.168
+0010.50	+000019.33	+00001.316	-00000.963	+00002.215
+0011.00	+000020.43	+00001.257	-00000.911	+00002.268
+0011.50	+000021.56	+00001.212	-00000.876	+00002.313
+0012.00	+000022.73	+00001.180	-00000.855	+00002.343
+0012.50	+000023.91	+00001.153	-00000.837	+00002.364
+0013.00	+000025.09	+00001.127	-00000.822	+00002.386
+0013.50	+000026.29	+00001.104	-00000.812	+00002.415
+0014.00	+000027.51	+00001.085	-00000.808	+00002.449
+0014.50	+000028.74	+00001.071	-00000.810	+00002.484
+0015.00	+000029.99	+00001.062	-00000.818	+00002.519
+0015.50	+000031.26	+00001.059	-00000.832	+00002.554
+0016.00	+000032.55	+00001.062	-00000.851	+00002.588
+0016.50	+000033.85	+00001.071	-00000.874	+00002.622
+0017.00	+000035.17	+00001.082	-00000.900	+00002.657
+0017.50	+000036.51	+00001.097	-00000.927	+00002.691
+0018.00	+000037.86	+00001.112	-00000.955	+00002.726
+0018.50	+000039.23	+00001.126	-00000.982	+00002.762
+0019.00	+000040.62	+00001.139	-00001.008	+00002.798
+0019.50	+000042.03	+00001.151	-00001.034	+00002.835

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TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0020.00	+000043.46	+00001.164	-00001.060	+00002.874
+0020.50	+000044.91	+00001.181	-00001.091	+00002.916
+0021.00	+000046.38	+00001.204	-00001.127	+00002.959
+0021.50	+000047.87	+00001.233	-00001.165	+00002.999
+0022.00	+000049.37	+00001.261	-00001.202	+00003.036
+0022.50	+000050.90	+00001.283	-00001.230	+00003.069
+0023.00	+000052.44	+00001.294	-00001.245	+00003.100
+0023.50	+000054.00	+00001.291	-00001.244	+00003.129
+0024.00	+000055.57	+00001.272	-00001.224	+00003.157
+0024.50	+000057.16	+00001.239	-00001.187	+00003.185
+0025.00	+000058.76	+00001.193	-00001.135	+00003.215
+0025.50	+000060.37	+00001.139	-00001.071	+00003.248
+0026.00	+000062.01	+00001.082	-00001.000	+00003.285
+0026.50	+000063.66	+00001.029	-00000.926	+00003.325
+0027.00	+000065.33	+00000.985	-00000.854	+00003.369
+0027.50	+000067.03	+00000.956	-00000.789	+00003.417
+0028.00	+000068.75	+00000.945	-00000.735	+00003.468
+0028.50	+000070.50	+00000.954	-00000.694	+00003.522
+0029.00	+000072.27	+00000.982	-00000.668	+00003.579
+0029.50	+000074.08	+00001.027	-00000.660	+00003.636
+0030.00	+000075.91	+00001.087	-00000.669	+00003.693
+0030.50	+000077.77	+00001.160	-00000.695	+00003.748
+0031.00	+000079.66	+00001.245	-00000.736	+00003.800
+0031.50	+000081.57	+00001.339	-00000.789	+00003.847
+0032.00	+000083.50	+00001.442	-00000.851	+00003.891
+0032.50	+000085.46	+00001.552	-00000.918	+00003.932
+0033.00	+000087.43	+00001.666	-00000.988	+00003.971
+0033.50	+000089.43	+00001.783	-00001.059	+00004.007
+0034.00	+000091.44	+00001.900	-00001.126	+00004.041
+0034.50	+000093.47	+00002.014	-00001.189	+00004.073
+0035.00	+000095.51	+00002.125	-00001.244	+00004.104
+0035.50	+000097.57	+00002.233	-00001.291	+00004.134
+0036.00	+000099.65	+00002.338	-00001.329	+00004.165
+0036.50	+000101.74	+00002.441	-00001.358	+00004.197
+0037.00	+000103.85	+00002.542	-00001.379	+00004.231
+0037.50	+000105.97	+00002.644	-00001.394	+00004.269
+0038.00	+000108.12	+00002.749	-00001.403	+00004.311
+0038.50	+000110.28	+00002.857	-00001.409	+00004.356
+0039.00	+000112.47	+00002.969	-00001.414	+00004.406
+0039.50	+000114.69	+00003.087	-00001.420	+00004.456

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TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0040.00	+000116.93	+00003.211	-00001.424	+00004.506
+0040.50	+000119.19	+00003.338	-00001.427	+00004.553
+0041.00	+000121.48	+00003.470	-00001.425	+00004.599
+0041.50	+000123.79	+00003.604	-00001.419	+00004.644
+0042.00	+000126.13	+00003.740	-00001.408	+00004.691
+0042.50	+000128.48	+00003.879	-00001.393	+00004.738
+0043.00	+000130.86	+00004.021	-00001.373	+00004.786
+0043.50	+000133.27	+00004.165	-00001.351	+00004.835
+0044.00	+000135.70	+00004.312	-00001.327	+00004.886
+0044.50	+000138.16	+00004.461	-00001.301	+00004.938
+0045.00	+000140.64	+00004.612	-00001.275	+00004.992
+0045.50	+000143.15	+00004.766	-00001.249	+00005.047
+0046.00	+000145.69	+00004.922	-00001.225	+00005.104
+0046.50	+000148.25	+00005.082	-00001.202	+00005.163
+0047.00	+000150.85	+00005.245	-00001.180	+00005.224
+0047.50	+000153.48	+00005.412	-00001.161	+00005.286
+0048.00	+000156.14	+00005.582	-00001.143	+00005.349
+0048.50	+000158.83	+00005.757	-00001.126	+00005.412
+0049.00	+000161.55	+00005.935	-00001.109	+00005.476
+0049.50	+000164.30	+00006.118	-00001.092	+00005.538
+0050.00	+000167.09	+00006.305	-00001.075	+00005.600
+0050.50	+000169.90	+00006.497	-00001.057	+00005.662
+0051.00	+000172.75	+00006.693	-00001.038	+00005.723
+0051.50	+000175.62	+00006.892	-00001.018	+00005.785
+0052.00	+000178.53	+00007.094	-00000.997	+00005.847
+0052.50	+000181.47	+00007.297	-00000.977	+00005.909
+0053.00	+000184.44	+00007.502	-00000.957	+00005.971
+0053.50	+000187.44	+00007.709	-00000.937	+00006.032
+0054.00	+000190.47	+00007.918	-00000.917	+00006.093
+0054.50	+000193.53	+00008.128	-00000.898	+00006.154
+0055.00	+000196.63	+00008.339	-00000.880	+00006.216
+0055.50	+000199.75	+00008.552	-00000.863	+00006.278
+0056.00	+000202.91	+00008.767	-00000.847	+00006.341
+0056.50	+000206.09	+00008.981	-00000.832	+00006.404
+0057.00	+000209.31	+00009.197	-00000.818	+00006.467
+0057.50	+000212.56	+00009.412	-00000.805	+00006.531
+0058.00	+000215.84	+00009.629	-00000.793	+00006.595
+0058.50	+000219.15	+00009.846	-00000.781	+00006.659
+0059.00	+000222.50	+00010.064	-00000.770	+00006.725
+0059.50	+000225.88	+00010.283	-00000.760	+00006.791

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TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0060.00	+000229.29	+00010.505	-00000.750	+00006.859
+0060.50	+000232.74	+00010.729	-00000.740	+00006.928
+0061.00	+000236.22	+00010.956	-00000.730	+00006.997
+0061.50	+000239.74	+00011.186	-00000.720	+00007.068
+0062.00	+000243.29	+00011.419	-00000.710	+00007.139
+0062.50	+000246.87	+00011.655	-00000.700	+00007.210
+0063.00	+000250.50	+00011.894	-00000.690	+00007.280
+0063.50	+000254.15	+00012.135	-00000.681	+00007.348
+0064.00	+000257.84	+00012.378	-00000.672	+00007.415
+0064.50	+000261.57	+00012.623	-00000.664	+00007.479
+0065.00	+000265.32	+00012.868	-00000.657	+00007.539
+0065.50	+000269.11	+00013.114	-00000.650	+00007.597
+0066.00	+000272.92	+00013.361	-00000.644	+00007.650
+0066.50	+000276.76	+00013.607	-00000.639	+00007.699
+0067.00	+000280.62	+00013.853	-00000.635	+00007.743
+0067.50	+000284.50	+00014.100	-00000.631	+00007.782
+0068.00	+000288.40	+00014.346	-00000.628	+00007.815
+0068.50	+000292.31	+00014.593	-00000.624	+00007.844
+0069.00	+000296.24	+00014.841	-00000.622	+00007.869
+0069.50	+000300.18	+00015.090	-00000.619	+00007.891
+0070.00	+000304.13	+00015.341	-00000.616	+00007.912
+0070.50	+000308.09	+00015.593	-00000.613	+00007.932
+0071.00	+000312.06	+00015.846	-00000.610	+00007.954
+0071.50	+000316.05	+00016.101	-00000.607	+00007.980
+0072.00	+000320.04	+00016.358	-00000.603	+00008.010
+0072.50	+000324.06	+00016.615	-00000.598	+00008.047
+0073.00	+000328.09	+00016.873	-00000.592	+00008.091
+0073.50	+000332.15	+00017.131	-00000.585	+00008.144
+0074.00	+000336.24	+00017.389	-00000.576	+00008.205
+0074.50	+000340.36	+00017.646	-00000.567	+00008.276
+0075.00	+000344.52	+00017.902	-00000.555	+00008.356
+0075.50	+000348.72	+00018.157	-00000.543	+00008.446
+0076.00	+000352.96	+00018.412	-00000.529	+00008.544
+0076.50	+000357.26	+00018.665	-00000.513	+00008.652
+0077.00	+000361.62	+00018.919	-00000.496	+00008.768
+0077.50	+000366.03	+00019.172	-00000.477	+00008.892
+0078.00	+000370.51	+00019.425	-00000.456	+00009.023
+0078.50	+000375.06	+00019.678	-00000.434	+00009.160
+0079.00	+000379.67	+00019.932	-00000.409	+00009.303
+0079.50	+000384.36	+00020.186	-00000.383	+00009.451

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TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0080.00	+000389.12	+00020.440	-00000.355	+00009.602
+0080.50	+000393.96	+00020.693	-00000.326	+00009.755
+0081.00	+000398.88	+00020.945	-00000.294	+00009.910
+0081.50	+000403.87	+00021.196	-00000.261	+00010.066
+0082.00	+000408.94	+00021.444	-00000.227	+00010.221
+0082.50	+000414.09	+00021.689	-00000.192	+00010.377
+0083.00	+000419.32	+00021.931	-00000.156	+00010.533
+0083.50	+000424.63	+00022.170	-00000.120	+00010.689
+0084.00	+000430.01	+00022.406	-00000.085	+00010.848
+0084.50	+000435.47	+00022.639	-00000.051	+00011.008
+0085.00	+000441.02	+00022.869	-00000.018	+00011.171
+0085.50	+000446.65	+00023.097	+00000.012	+00011.338
+0086.00	+000452.36	+00023.323	+00000.040	+00011.510
+0086.50	+000458.16	+00023.547	+00000.064	+00011.687
+0087.00	+000464.05	+00023.771	+00000.086	+00011.869
+0087.50	+000470.03	+00023.994	+00000.105	+00012.057
+0088.00	+000476.10	+00024.217	+00000.121	+00012.251
+0088.50	+000482.28	+00024.439	+00000.133	+00012.451
+0089.00	+000488.56	+00024.661	+00000.143	+00012.656
+0089.50	+000494.94	+00024.884	+00000.151	+00012.867
+0090.00	+000501.42	+00025.106	+00000.157	+00013.083
+0090.50	+000508.02	+00025.328	+00000.162	+00013.304
+0091.00	+000514.73	+00025.550	+00000.165	+00013.529
+0091.50	+000521.55	+00025.772	+00000.168	+00013.757
+0092.00	+000528.49	+00025.993	+00000.170	+00013.988
+0092.50	+000535.54	+00026.214	+00000.173	+00014.222
+0093.00	+000542.71	+00026.435	+00000.177	+00014.459
+0093.50	+000550.00	+00026.655	+00000.181	+00014.697
+0094.00	+000557.41	+00026.876	+00000.185	+00014.938
+0094.50	+000564.94	+00027.096	+00000.190	+00015.180
+0095.00	+000572.59	+00027.316	+00000.195	+00015.424
+0095.50	+000580.36	+00027.535	+00000.201	+00015.670
+0096.00	+000588.26	+00027.752	+00000.206	+00015.917
+0096.50	+000596.28	+00027.968	+00000.210	+00016.165
+0097.00	+000604.42	+00028.181	+00000.213	+00016.414
+0097.50	+000612.69	+00028.391	+00000.215	+00016.663
+0098.00	+000621.09	+00028.597	+00000.216	+00016.914
+0098.50	+000629.61	+00028.799	+00000.214	+00017.166
+0099.00	+000638.25	+00028.997	+00000.212	+00017.419
+0099.50	+000647.03	+00029.191	+00000.207	+00017.672

TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0100.00	+000655.93	+00029.381	+00000.202	+00017.927
+0100.50	+000664.95	+00029.568	+00000.195	+00018.182
+0101.00	+000674.11	+00029.753	+00000.188	+00018.440
+0101.50	+000683.39	+00029.936	+00000.180	+00018.699
+0102.00	+000692.81	+00030.118	+00000.171	+00018.961
+0102.50	+000702.35	+00030.301	+00000.163	+00019.226
+0103.00	+000712.03	+00030.486	+00000.155	+00019.495
+0103.50	+000721.85	+00030.674	+00000.148	+00019.767
+0104.00	+000731.80	+00030.864	+00000.142	+00020.044
+0104.50	+000741.89	+00031.057	+00000.137	+00020.324
+0105.00	+000752.13	+00031.254	+00000.133	+00020.606
+0105.50	+000762.50	+00031.453	+00000.131	+00020.892
+0106.00	+000773.02	+00031.654	+00000.130	+00021.179
+0106.50	+000783.68	+00031.856	+00000.131	+00021.468
+0107.00	+000794.49	+00032.058	+00000.133	+00021.758
+0107.50	+000805.44	+00032.261	+00000.137	+00022.049
+0108.00	+000816.54	+00032.462	+00000.142	+00022.340
+0108.50	+000827.78	+00032.661	+00000.147	+00022.631
+0109.00	+000839.17	+00032.858	+00000.154	+00022.922
+0109.50	+000850.70	+00033.052	+00000.162	+00023.214
+0110.00	+000862.38	+00033.244	+00000.171	+00023.507
+0110.50	+000874.21	+00033.432	+00000.180	+00023.802
+0111.00	+000886.18	+00033.617	+00000.190	+00024.099
+0111.50	+000898.31	+00033.799	+00000.200	+00024.398
+0112.00	+000910.58	+00033.978	+00000.210	+00024.700
+0112.50	+000923.01	+00034.154	+00000.221	+00025.006
+0113.00	+000935.59	+00034.328	+00000.232	+00025.315
+0113.50	+000948.32	+00034.500	+00000.242	+00025.628
+0114.00	+000961.22	+00034.669	+00000.252	+00025.944
+0114.50	+000974.27	+00034.837	+00000.262	+00026.263
+0115.00	+000987.48	+00035.004	+00000.271	+00026.586
+0115.50	+001000.85	+00035.169	+00000.280	+00026.913
+0116.00	+001014.39	+00035.333	+00000.288	+00027.243
+0116.50	+001028.10	+00035.496	+00000.295	+00027.577
+0117.00	+001041.97	+00035.657	+00000.302	+00027.914
+0117.50	+001056.01	+00035.817	+00000.308	+00028.255
+0118.00	+001070.23	+00035.976	+00000.314	+00028.600
+0118.50	+001084.61	+00036.133	+00000.319	+00028.949
+0119.00	+001099.18	+00036.288	+00000.323	+00029.301
+0119.50	+001113.92	+00036.441	+00000.328	+00029.657

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TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0120.00	+001128.83	+00036.593	+00000.331	+00030.017
+0120.50	+001143.93	+00036.743	+00000.335	+00030.380
+0121.00	+001159.22	+00036.891	+00000.339	+00030.748
+0121.50	+001174.68	+00037.038	+00000.343	+00031.120
+0122.00	+001190.34	+00037.184	+00000.346	+00031.495
+0122.50	+001206.18	+00037.328	+00000.350	+00031.873
+0123.00	+001222.21	+00037.470	+00000.354	+00032.254
+0123.50	+001238.43	+00037.612	+00000.358	+00032.639
+0124.00	+001254.85	+00037.752	+00000.362	+00033.028
+0124.50	+001271.46	+00037.891	+00000.366	+00033.422
+0125.00	+001288.27	+00038.029	+00000.370	+00033.821
+0125.50	+001305.28	+00038.165	+00000.373	+00034.225
+0126.00	+001322.50	+00038.301	+00000.377	+00034.634
+0126.50	+001339.92	+00038.435	+00000.380	+00035.051
+0127.00	+001357.55	+00038.568	+00000.383	+00035.474
+0127.50	+001375.39	+00038.700	+00000.386	+00035.905
+0128.00	+001393.45	+00038.831	+00000.388	+00036.342
+0128.50	+001411.74	+00038.961	+00000.391	+00036.787
+0129.00	+001430.24	+00039.089	+00000.393	+00037.240
+0129.50	+001448.98	+00039.215	+00000.395	+00037.700
+0130.00	+001467.94	+00039.339	+00000.397	+00038.167
+0130.50	+001487.15	+00039.461	+00000.398	+00038.643
+0131.00	+001506.58	+00039.580	+00000.400	+00039.125
+0131.50	+001526.26	+00039.697	+00000.401	+00039.611
+0132.00	+001546.20	+00039.811	+00000.402	+00040.106
+0132.50	+001566.40	+00039.923	+00000.403	+00040.613
+0133.00	+001586.85	+00040.031	+00000.405	+00041.133
+0133.50	+001607.55	+00040.136	+00000.408	+00041.662
+0134.00	+001628.52	+00040.239	+00000.409	+00042.197
+0134.50	+001649.75	+00040.339	+00000.411	+00042.743
+0135.00	+001671.26	+00040.437	+00000.412	+00043.295
+0135.50	+001693.05	+00040.532	+00000.413	+00043.848
+0136.00	+001715.11	+00040.624	+00000.413	+00044.412
+0136.50	+001737.45	+00040.711	+00000.416	+00045.010
+0137.00	+001760.07	+00040.797	+00000.421	+00045.668
+0137.50	+001783.01	+00040.879	+00000.429	+00046.162
+0138.00	+001806.37	+00040.979	+00000.419	+00046.663
+0138.50	+001830.01	+00041.071	+00000.411	+00047.154
+0139.00	+001853.86	+00041.143	+00000.415	+00047.635
+0139.50	+001878.01	+00041.210	+00000.424	+00048.107

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TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0140.00	+001902.53	+00041.257	+00000.434	+00048.569
+0140.50	+001927.91	+00041.403	+00000.421	+00049.028
+0141.00	+001953.24	+00041.485	+00000.405	+00049.474
+0141.50	+001978.90	+00041.521	+00000.410	+00049.908
+0142.00	+002001.63	+00041.417	+00000.503	+00050.330
+0142.50	+002015.79	+00041.667	+00000.447	+00013.587
+0143.00	+002016.66	+00041.812	+00000.391	-00004.547
+0143.50	+002015.51	+00041.783	+00000.437	-00000.884
+0144.00	+002014.48	+00041.823	+00000.465	-00002.478
+0144.50	+002012.93	+00041.974	+00000.447	-00006.500
+0145.00	+002009.38	+00042.044	+00000.440	-00006.579
+0150.00	+001973.90	+00042.877	+00000.472	-00007.127
+0155.00	+001937.90	+00043.768	+00000.495	-00007.097
+0160.00	+001903.37	+00044.665	+00000.524	-00006.737
+0165.00	+001869.82	+00045.611	+00000.568	-00006.727
+0170.00	+001835.97	+00046.545	+00000.581	-00006.773
+0175.00	+001802.55	+00047.564	+00000.607	-00006.577
+0180.00	+001770.43	+00048.539	+00000.627	-00006.282
+0185.00	+001739.64	+00049.568	+00000.661	-00006.049
+0190.00	+001709.72	+00050.678	+00000.697	-00005.933
+0195.00	+001680.37	+00051.817	+00000.723	-00005.783
+0200.00	+001651.83	+00053.026	+00000.749	-00005.668
+0205.00	+001623.85	+00054.251	+00000.793	-00005.483
+0210.00	+001596.85	+00055.530	+00000.827	-00005.374
+0215.00	+001570.49	+00056.824	+00000.863	-00005.114
+0220.00	+001545.41	+00058.175	+00000.898	-00004.946
+0225.00	+001521.14	+00059.557	+00000.932	-00004.733
+0230.00	+001498.09	+00061.008	+00000.966	-00004.475
+0235.00	+001476.44	+00062.539	+00000.994	-00004.278
+0240.00	+001455.12	+00064.004	+00001.043	-00004.146
+0245.00	+001435.44	+00065.578	+00001.082	-00003.740
+0250.00	+001417.05	+00067.199	+00001.108	-00003.612
+0255.00	+001399.67	+00068.842	+00001.141	-00003.325
+0260.00	+001384.00	+00070.557	+00001.174	-00002.956
+0265.00	+001368.38	+00072.191	+00001.236	-00003.496
+0270.00	+001352.75	+00073.749	+00001.196	-00002.237
+0275.00	+001344.20	+00075.819	+00001.246	-00001.827
+0280.00	+001333.40	+00077.616	+00001.289	-00002.208
+0285.00	+001324.20	+00079.463	+00001.297	-00001.415
+0290.00	+001317.85	+00081.431	+00001.293	-00001.416

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TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0295.00	+001310.55	+00083.232	+00001.364	-00001.167
+0300.00	+001306.11	+00085.143	+00001.373	-00000.690
+0305.00	+001302.96	+00087.062	+00001.407	-00000.507
+0310.00	+001302.11	+00089.024	+00001.442	+00000.073
+0315.00	+001303.40	+00091.017	+00001.454	+00000.355
+0320.00	+001305.03	+00092.972	+00001.467	+00000.242
+0325.00	+001306.17	+00094.835	+00001.474	+00000.507
+0330.00	+001310.65	+00096.728	+00001.490	+00001.078
+0335.00	+001316.89	+00098.581	+00001.499	+00001.010
+0340.00	+001321.53	+00100.234	+00001.557	+00001.568
+0345.00	+001335.22	+00102.262	+00001.558	+00003.367
+0350.00	+001348.82	+00104.194	+00001.533	+00001.750
+0355.00	+001356.96	+00105.810	+00001.503	+00002.267
+0360.00	+001373.26	+00107.655	+00001.548	+00003.605
+0365.00	+001387.84	+00109.359	+00001.535	+00002.729
+0370.00	+001402.77	+00110.998	+00001.531	+00003.813
+0375.00	+001425.08	+00112.806	+00001.515	+00004.263
+0380.00	+001442.77	+00114.373	+00001.479	+00003.253
+0385.00	+001461.29	+00115.894	+00001.493	+00003.950
+0390.00	+001482.52	+00117.420	+00001.495	+00004.557
+0395.00	+001504.87	+00118.917	+00001.476	+00004.118
+0400.00	+001525.36	+00120.279	+00001.478	+00004.871
+0405.00	+001553.81	+00121.769	+00001.431	+00005.588
+0410.00	+001575.65	+00123.009	+00001.447	+00004.198
+0415.00	+001603.48	+00124.326	+00001.447	+00006.590
+0420.00	+001633.48	+00125.640	+00001.407	+00004.727
+0425.00	+001658.61	+00126.799	+00001.371	+00005.629
+0430.00	+001688.14	+00127.985	+00001.382	+00005.640
+0435.00	+001716.84	+00129.082	+00001.348	+00007.628
+0440.00	+001754.19	+00130.311	+00001.632	+00006.060
+0445.00	+001780.67	+00131.243	+00001.400	+00006.127
+0450.00	+001815.31	+00132.291	+00001.309	+00005.527
+0455.00	+001835.69	+00133.212	+00001.293	+00003.763
+0460.00	+001858.60	+00134.091	+00001.287	+00005.461

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41

TABLE III

T SEC	VG. M/SEC	THETA P.L. DEG	THETA Y. DEG	VG DOT M/SEC SQ
465.00	1888.68	134.954	1.280	6.699
470.00	1922.26	135.865	1.263	6.705
475.00	1955.39	136.744	1.246	6.490
478.50	1977.42	137.342	1.234	6.054
480.00	1986.30	137.595	1.229	5.746
485.00	2011.00	138.419	1.212	3.876
490.00	2021.18	139.223	1.195	-0.524
495.00	1989.07	140.018	1.177	-14.183
500.00	1847.01	140.841	1.158	-46.818
507.74	1226.42	142.649	1.219	-99.335
510.00	1008.27	143.405	1.230	-92.906
515.00	626.79	145.956	1.287	-59.912
520.00	404.90	149.601	1.449	-32.364
525.00	287.67	154.204	1.510	-17.897
530.00	230.75	159.097	1.489	-8.519
535.00	196.17	163.942	1.148	-5.609
540.00	173.68	168.123	1.307	-3.652
545.00	158.27	171.249	1.452	-2.600
550.00	146.98	173.499	1.750	-1.971
555.00	138.25	175.526	1.652	-1.551
560.00	131.31	177.286	1.460	-1.255
565.00	125.51	178.097	1.435	-1.075
570.00	120.52	178.338	1.388	-0.931
575.00	116.22	178.191	1.213	-0.805
580.00	112.39	177.708	1.036	-0.726
585.00	108.85	177.322	0.772	-0.701
590.00	105.48	177.279	0.393	-0.633
595.00	102.46	177.097	-0.108	-0.590
600.00	99.65	176.906	-0.354	-0.556
605.00	96.88	177.038	-0.588	-0.536
610.00	94.36	177.050	-0.983	-0.477
615.00	92.01	176.892	-1.473	-0.474
620.00	89.61	176.905	-2.262	-0.474
625.00	87.36	176.995	-2.720	-0.425
630.00	85.39	177.014	-2.819	-0.377
635.00	83.54	177.087	-2.669	-0.359
640.00	81.82	176.705	-2.992	-0.330
645.00	80.26	175.822	-3.814	-0.298
650.00	78.79	174.755	-4.853	-0.297
655.00	77.27	174.244	-5.428	-0.308
660.00	75.77	174.197	-5.528	-0.288

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TABLE III

T SEC	VG. M/SEC	THETA P.L. DEG	THETA Y. DEG	VG DOT M/SEC SQ
665.00	74.41	174.333	-5.292	-0.261
670.00	73.17	174.406	-4.946	-0.232
675.00	72.09	174.247	-4.564	-0.215
678.75	71.08	174.646	-4.015	-0.337

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CAPSULE

TABLE I C

T SEC	X M	Y M	Z M
+0152.00	+00051261.	+00075161.	+00000213.
+0155.00	+0005303.	+00079401.	+00000301.
+0160.00	+00062E00.	+00086351.	+00000424.
+0165.00	+00068871.	+00092914.	+00000479.
+0170.00	+00075623.	+00099198.	+00000510.
+0175.00	+00082380.	+00105442.	+00000669.
+0180.00	+00089174.	+00111269.	+00000646.
+0185.00	+00095917.	+00117103.	+00000891.
+0190.00	+00102632.	+00122529.	+00000989.
+0195.00	+00109350.	+00127757.	+00001104.
+0200.00	+00116074.	+00132776.	+00001205.
+0205.00	+00122786.	+00137547.	+00001328.
+0210.00	+00129537.	+00142151.	+00001469.
+0215.00	+00136294.	+00146445.	+00001541.
+0220.00	+00142894.	+00150508.	+00001717.
+0225.00	+00149647.	+00154232.	+00001663.
+0230.00	+00156280.	+00157926.	+00001898.
+0235.00	+00162992.	+00161332.	+00002019.
+0240.00	+00169635.	+00164514.	+00002185.
+0245.00	+00176299.	+00167391.	+00002251.
+0250.00	+00182910.	+00170125.	+00002436.
+0255.00	+00189583.	+00172600.	+00002555.
+0260.00	+00196220.	+00174865.	+00002710.
+0265.00	+00202850.	+00176883.	+00002847.
+0270.00	+00209438.	+00178672.	+00002989.
+0275.00	+00216091.	+00180250.	+00003140.
+0280.00	+00222668.	+00181622.	+00003335.
+0285.00	+00229256.	+00182700.	+00003466.
+0290.00	+00235851.	+00183595.	+00003600.
+0295.00	+00242425.	+00184262.	+00003762.
+0300.00	+00248987.	+00184677.	+00003900.
+0305.00	+00255533.	+00184913.	+00004093.
+0310.00	+00262099.	+00184877.	+00004236.
+0315.00	+00268479.	+00184639.	+00004425.
+0320.00	+00274780.	+00184079.	+00004529.
+0325.00	+00280921.	+00183154.	+00004535.
+0330.00	+00286834.	+00182005.	+00004608.
+0335.00	+00292748.	+00180574.	+00004670.
+0340.00	+00298628.	+00178925.	+00004739.
+0345.00	+00304518.	+00177045.	+00004814.

TABLE I

T SEC	X M	Y M	Z M
+0350.00	+00310424.	+00174903.	+00004862.
+0355.00	+00316325.	+00172550.	+00004940.
+0360.00	+00322139.	+00169970.	+00004985.
+0365.00	+00328018.	+00167153.	+00005051.
+0370.00	+00333811.	+00164160.	+00005136.
+0375.00	+00339657.	+00160913.	+00005233.
+0380.00	+00345407.	+00157471.	+00005316.
+0385.00	+00351219.	+00153789.	+00005427.
+0390.00	+00357007.	+00149833.	+00005481.
+0395.00	+00362795.	+00145631.	+00005529.
+0400.00	+00368569.	+00141234.	+00005608.
+0405.00	+00374314.	+00136638.	+00005703.
+0410.00	+00380086.	+00131733.	+00005757.
+0415.00	+00385820.	+00126694.	+00005878.
+0420.00	+00391632.	+00121252.	+00005931.
+0425.00	+00397276.	+00115732.	+00005994.
+0430.00	+00403008.	+00109980.	+00006099.
+0435.00	+00408741.	+00103915.	+00006185.
+0440.00	+00414459.	+00097636.	+00006284.
+0445.00	+00420054.	+00091231.	+00006346.

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45

TABLE I

T SEC	X M	Y M	Z M
450.00	425725.9	84537.00	6453.96
455.00	431402.0	77571.38	6555.64
460.00	437066.4	70372.31	6658.27
465.00	442718.2	62940.38	6761.73
470.00	448354.6	55278.69	6866.01
471.56	450111.2	52839.56	6898.76
475.00	453967.8	47397.69	6970.95
480.00	459539.0	39323.94	7076.05
485.00	465026.0	31120.56	7180.55
490.00	470317.9	22958.81	7282.23
499.91	478836.7	9146.44	7452.63
500.00	478894.4	9047.94	7453.97
505.00	481338.1	4743.50	7513.72
510.00	482748.8	1994.25	7553.99
515.00	483561.4	137.69	7587.18
520.00	484054.5	-1263.38	7614.27
525.00	484358.8	-2409.44	7638.77
530.00	484542.0	-3399.81	7657.04
535.00	484641.7	-4286.94	7671.20
540.00	484689.0	-5100.81	7686.87
545.00	484704.2	-5858.88	7705.46
550.00	484697.4	-6572.63	7725.98
555.00	484671.6	-7249.94	7743.71
560.00	484631.6	-7896.63	7759.59
565.00	484583.9	-8516.81	7774.90
570.00	484530.1	-9113.69	7788.66
575.00	484470.2	-9689.88	7800.51
580.00	484405.4	-10247.38	7809.85
585.00	484339.4	-10787.38	7816.22
590.00	484273.6	-11311.19	7818.15
595.00	484207.9	-11820.25	7816.62
596.60	484187.0	-11980.13	7815.76
596.60	484187.0	-11980.13	7815.76
596.82	484184.0	-12002.00	7815.59
596.82	484184.0	-12002.00	7815.59
600.00	484145.0	-12295.69	7813.11
605.00	484089.2	-12712.06	7806.87
610.00	484035.8	-13104.63	7797.36
615.00	483984.1	-13484.94	7783.94
620.00	483937.7	-13856.19	7765.09
625.00	483897.1	-14219.75	7743.22

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TABLE I

T SEC	X M	Y M	Z M
630.00	483859.4	-14576.38	7721.26
635.00	483821.6	-14926.69	7700.91
640.00	483783.1	-15270.88	7681.70
640.60	483778.4	-15311.44	7679.28
640.60	483778.4	-15311.44	7679.28
640.60	483778.4	-15311.44	7679.28
641.37	483772.6	-15360.69	7676.09
641.37	483772.6	-15360.69	7676.09
644.60	483753.0	-15487.13	7660.60
644.60	483753.0	-15487.13	7660.60
647.55	483738.4	-15545.75	7644.29
647.55	483738.4	-15545.75	7644.29
650.00	483727.8	-15571.06	7629.90
655.00	483705.8	-15621.38	7599.44
660.00	483683.4	-15671.50	7567.73
665.00	483660.5	-15721.50	7534.67
670.00	483636.8	-15771.44	7500.04
675.00	483612.7	-15821.25	7463.99
680.00	483588.3	-15870.94	7426.81
685.00	483563.7	-15920.69	7388.62
690.00	483539.1	-15970.13	7349.56
695.00	483514.7	-16019.44	7309.56
700.00	483490.4	-16068.69	7268.95
705.00	483466.4	-16117.69	7227.97
710.00	483442.6	-16166.69	7186.80
715.00	483419.2	-16215.50	7145.71
720.00	483396.4	-16264.19	7105.28
725.00	483374.0	-16312.75	7065.16
730.00	483352.0	-16361.19	7025.31
735.00	483330.5	-16409.44	6985.78
740.00	483309.6	-16457.50	6946.56
745.00	483289.4	-16505.56	6907.61
750.00	483269.7	-16553.44	6869.06
755.00	483250.2	-16601.19	6830.89
760.00	483231.1	-16648.81	6793.20
765.00	483212.1	-16696.38	6755.97
770.00	483193.1	-16743.81	6719.34
775.00	483174.1	-16791.19	6683.29
780.00	483155.0	-16838.38	6647.76
785.00	483135.7	-16885.50	6612.83
790.00	483116.2	-16932.56	6578.48

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47

TABLE I

T SEC	X M	Y M	Z M
795.00	483096.2	-16979.44	6544.94
800.00	483075.8	-17026.44	6512.02
805.00	483055.0	-17073.25	6479.67
810.00	483033.8	-17119.88	6447.83
815.00	483012.1	-17166.56	6416.46
820.00	482990.0	-17213.19	6385.44
825.00	482967.4	-17259.69	6354.73
830.00	482944.2	-17306.19	6324.44
835.00	482920.6	-17352.56	6294.59
840.00	482896.4	-17398.88	6265.15
845.00	482871.6	-17445.13	6236.20
850.00	482846.4	-17491.25	6207.68
855.00	482820.6	-17537.50	6179.59
860.00	482793.9	-17583.50	6151.90
865.00	482766.6	-17629.56	6124.62
870.00	482738.3	-17675.50	6097.71
875.00	482708.7	-17721.50	6071.15
880.00	482678.2	-17767.38	6044.96
885.00	482647.1	-17813.19	6019.19
890.00	482615.3	-17859.13	5993.81
895.00	482582.9	-17905.00	5968.81
900.00	482548.3	-17950.75	5943.44
905.00	482513.7	-17996.50	5918.71
910.00	482479.9	-18042.06	5894.92
915.00	482447.5	-18087.50	5872.43
920.00	482417.3	-18132.81	5851.54
925.00	482389.9	-18177.81	5832.45
930.00	482365.8	-18222.56	5815.42
933.96	482349.4	-18257.69	5803.60

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TABLE IIC

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0152.00	+00050.663	+00075.378	+00007.161	+00000008.0
+0155.00	+00054.635	+00079.631	+00007.551	+0000003.9
+0160.00	+00061.262	+00086.622	+00007.428	+0000000.9
+0165.00	+00067.869	+00093.287	+00007.244	+0000000.2
+0170.00	+00074.458	+00099.716	+00007.141	+0000000.1
+0175.00	+00081.041	+00105.943	+00007.024	+0000000.0
+0180.00	+00087.611	+00111.953	+00006.907	+0000000.0
+0185.00	+00094.165	+00117.742	+00006.791	+0000000.0
+0190.00	+00100.689	+00123.324	+00006.673	+0000000.0
+0195.00	+00107.201	+00128.698	+00006.560	+0000000.0
+0200.00	+00113.702	+00133.804	+00006.436	+0000000.0
+0205.00	+00120.203	+00138.727	+00006.383	+0000000.0
+0210.00	+00126.710	+00143.402	+00006.213	+0000000.0
+0215.00	+00133.221	+00147.746	+00006.131	+0000000.0
+0220.00	+00139.639	+00152.002	+00005.992	+0000000.0
+0225.00	+00146.055	+00155.980	+00005.933	+0000000.0
+0230.00	+00152.485	+00159.808	+00005.872	+0000000.0
+0235.00	+00158.926	+00163.374	+00005.766	+0000000.0
+0240.00	+00165.334	+00166.714	+00005.669	+0000000.0
+0245.00	+00171.740	+00169.784	+00005.588	+0000000.0
+0250.00	+00178.130	+00172.683	+00005.535	+0000000.0
+0255.00	+00184.536	+00175.342	+00005.470	+0000000.0
+0260.00	+00190.923	+00177.796	+00005.400	+0000000.0
+0265.00	+00197.315	+00180.010	+00005.348	+0000000.0
+0270.00	+00203.687	+00182.018	+00005.288	+0000000.0
+0275.00	+00210.061	+00183.804	+00005.247	+0000000.0
+0280.00	+00216.416	+00185.379	+00005.194	+0000000.0
+0285.00	+00222.783	+00186.706	+00005.171	+0000000.0
+0290.00	+00229.141	+00187.838	+00005.131	+0000000.0
+0295.00	+00235.498	+00188.737	+00005.114	+0000000.0
+0300.00	+00241.856	+00189.419	+00005.095	+0000000.0
+0305.00	+00248.206	+00189.887	+00005.070	+0000000.0
+0310.00	+00254.536	+00190.126	+00005.045	+0000000.0
+0315.00	+00260.807	+00190.116	+00004.954	+0000000.0
+0320.00	+00266.933	+00189.813	+00004.841	+0000000.0
+0325.00	+00272.883	+00189.194	+00004.713	+0000000.0
+0330.00	+00278.705	+00188.291	+00004.711	+0000000.0
+0335.00	+00284.507	+00187.112	+00004.720	+0000000.0
+0340.00	+00290.295	+00185.721	+00004.772	+0000000.0
+0345.00	+00296.089	+00184.103	+00004.807	+0000000.0

TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
+0350.00	+00301.896	+00182.258	+00004.898	+0000000.0
+0355.00	+00307.720	+00180.178	+00004.918	+0000000.0
+0360.00	+00313.515	+00177.901	+00004.989	+0000000.0
+0365.00	+00319.329	+00175.400	+00005.042	+0000000.0
+0370.00	+00325.157	+00172.671	+00005.176	+0000000.0
+0375.00	+00331.014	+00169.693	+00005.184	+0000000.0
+0380.00	+00336.781	+00166.589	+00005.232	+0000000.0
+0385.00	+00342.610	+00163.223	+00005.385	+0000000.0
+0390.00	+00348.454	+00159.594	+00005.487	+0000000.0
+0395.00	+00354.336	+00155.707	+00005.612	+0000000.0
+0400.00	+00360.205	+00151.641	+00005.642	+0000000.0
+0405.00	+00366.064	+00147.378	+00005.789	+0000000.0
+0410.00	+00371.969	+00142.834	+00005.904	+0000000.0
+0415.00	+00377.874	+00138.098	+00006.017	+0000000.0
+0420.00	+00383.810	+00133.098	+00006.138	+0000000.0
+0425.00	+00389.723	+00127.907	+00006.225	+0000000.0
+0430.00	+00395.668	+00122.487	+00006.385	+0000000.0
+0435.00	+00401.648	+00116.819	+00006.506	+0000000.0
+0440.00	+00407.611	+00110.956	+00006.578	+0000000.0
+0445.00	+00413.549	+00104.887	+00006.716	+0000000.0

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50

TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
450.00	419.543	98.540	6.898	0.1
455.00	425.582	91.965	7.033	0.3
460.00	431.638	85.163	7.169	1.2
465.00	437.710	78.133	7.126	5.0
470.00	443.796	70.878	6.671	15.6
471.56	445.699	68.568	6.547	21.7
475.00	449.888	63.410	6.294	42.8
480.00	455.966	55.751	5.956	104.8
485.00	461.986	47.963	5.847	256.0
490.00	467.823	40.209	5.873	725.4
499.91	477.300	27.064	4.138	2294.6
500.00	477.365	26.971	4.108	2293.5
505.00	480.117	22.861	2.658	1802.4
510.00	481.727	20.226	1.711	1134.1
515.00	482.676	18.436	1.200	745.8
520.00	483.274	17.077	0.924	555.4
525.00	483.664	15.957	0.763	456.7
530.00	483.922	14.983	0.662	403.7
535.00	484.089	14.106	0.589	369.5
540.00	484.198	13.298	0.538	352.2
545.00	484.271	12.544	0.499	341.4
550.00	484.319	11.831	0.467	333.9
555.00	484.346	11.154	0.440	328.6
560.00	484.355	10.506	0.417	325.5
565.00	484.356	9.884	0.396	322.7
570.00	484.348	9.285	0.378	320.2
575.00	484.332	8.706	0.362	318.8
580.00	484.311	8.145	0.348	318.3
585.00	484.286	7.602	0.335	317.1
590.00	484.261	7.074	0.323	316.3
595.00	484.234	6.562	0.312	315.6
596.60	484.225	6.401	0.308	315.6
596.60	484.225	6.401	0.308	315.6
596.82	484.224	6.379	0.306	312.3
596.82	484.224	6.379	0.306	312.3
600.00	484.208	6.083	0.270	252.6
605.00	484.184	5.664	0.246	221.3
610.00	484.160	5.268	0.235	213.0
615.00	484.138	4.885	0.229	211.3
620.00	484.120	4.511	0.223	210.3
625.00	484.107	4.146	0.217	209.4

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51

TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
630.00	484.096	3.787	0.212	208.8
635.00	484.085	3.435	0.208	208.7
640.00	484.072	3.089	0.203	208.6
640.60	484.071	3.048	0.203	208.6
640.60	484.071	3.048	0.203	208.6
640.60	484.071	3.048	0.203	208.6
641.37	484.069	2.998	0.168	143.0
641.37	484.069	2.998	0.168	143.0
644.60	484.058	2.871	0.095	47.0
644.60	484.058	2.871	0.095	47.0
647.55	484.048	2.811	0.033	5.8
647.55	484.048	2.811	0.033	5.8
650.00	484.039	2.785	0.030	4.6
655.00	484.021	2.733	0.030	4.6
660.00	484.002	2.682	0.029	4.6
665.00	483.982	2.630	0.029	4.6
670.00	483.962	2.578	0.029	4.6
675.00	483.941	2.527	0.029	4.6
680.00	483.920	2.475	0.029	4.6
685.00	483.899	2.424	0.029	4.6
690.00	483.877	2.373	0.029	4.6
695.00	483.856	2.322	0.029	4.6
700.00	483.835	2.271	0.029	4.6
705.00	483.814	2.220	0.029	4.6
710.00	483.794	2.169	0.029	4.6
715.00	483.774	2.119	0.029	4.6
720.00	483.754	2.068	0.028	4.6
725.00	483.735	2.018	0.028	4.6
730.00	483.716	1.968	0.028	4.6
735.00	483.698	1.918	0.028	4.6
740.00	483.680	1.869	0.028	4.6
745.00	483.663	1.819	0.028	4.6
750.00	483.646	1.770	0.028	4.6
755.00	483.630	1.721	0.028	4.6
760.00	483.614	1.672	0.028	4.6
765.00	483.598	1.623	0.028	4.6
770.00	483.582	1.574	0.028	4.6
775.00	483.567	1.526	0.028	4.6
780.00	483.551	1.477	0.027	4.6
785.00	483.535	1.429	0.027	4.6
790.00	483.518	1.380	0.027	4.6

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TABLE II

T SEC	RANGE KM	ALTITUDE KM	MACH	Q KG/M SQ
795.00	483.501	1.332	0.027	4.6
800.00	483.484	1.283	0.027	4.6
805.00	483.467	1.235	0.027	4.6
810.00	483.449	1.187	0.027	4.6
815.00	483.430	1.139	0.027	4.6
820.00	483.411	1.090	0.027	4.6
825.00	483.392	1.042	0.027	4.6
830.00	483.372	0.994	0.027	4.6
835.00	483.352	0.946	0.027	4.6
840.00	483.331	0.898	0.027	4.6
845.00	483.309	0.850	0.026	4.6
850.00	483.287	0.802	0.026	4.6
855.00	483.264	0.754	0.026	4.6
860.00	483.241	0.706	0.026	4.6
865.00	483.217	0.658	0.026	4.6
870.00	483.192	0.610	0.026	4.6
875.00	483.166	0.562	0.026	4.6
880.00	483.138	0.514	0.026	4.6
885.00	483.111	0.466	0.026	4.6
890.00	483.082	0.418	0.026	4.6
895.00	483.053	0.370	0.026	4.6
900.00	483.022	0.321	0.026	4.6
905.00	482.990	0.273	0.026	4.6
910.00	482.960	0.225	0.026	4.6
915.00	482.931	0.177	0.025	4.6
920.00	482.904	0.130	0.025	4.6
925.00	482.880	0.083	0.025	4.6
930.00	482.859	0.036	0.025	4.6
933.96	482.845	-0.000	0.025	4.6

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TABLE IIIc

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0152.00	+001936.69	+00043.811	+00000.112	+00007.416
+0155.00	+001948.51	+00043.517	+00000.702	+00001.571
+0160.00	+001916.88	+00044.459	+00000.634	-00011.242
+0165.00	+001869.12	+00045.765	+00000.384	-00006.869
+0170.00	+001842.44	+00046.519	+00000.560	-00004.998
+0175.00	+001812.33	+00047.606	+00000.425	-00006.503
+0180.00	+001782.17	+00048.468	+00000.699	-00005.643
+0185.00	+001752.28	+00049.586	+00000.758	-00006.466
+0190.00	+001721.65	+00050.418	+00000.948	-00005.383
+0195.00	+001692.68	+00051.704	+00000.693	-00007.011
+0200.00	+001660.67	+00053.077	+00000.645	-00003.909
+0205.00	+001646.97	+00053.666	+00001.399	-00003.964
+0210.00	+001603.03	+00056.487	-00000.418	-00007.683
+0215.00	+001581.81	+00056.755	+00000.932	-00003.830
+0220.00	+001546.09	+00058.124	+00000.908	-00007.428
+0225.00	+001530.80	+00059.171	+00001.312	-00001.762
+0230.00	+001515.06	+00060.659	+00001.285	-00004.837
+0235.00	+001487.68	+00062.383	+00001.034	-00005.564
+0240.00	+001462.80	+00063.965	+00000.996	-00004.820
+0245.00	+001441.87	+00065.697	+00000.819	-00003.103
+0250.00	+001428.20	+00066.913	+00001.315	-00002.984
+0255.00	+001411.34	+00068.879	+00000.957	-00003.958
+0260.00	+001393.27	+00070.308	+00001.305	-00002.947
+0265.00	+001379.85	+00072.326	+00000.977	-00003.378
+0270.00	+001364.33	+00073.748	+00001.418	-00002.287
+0275.00	+001353.76	+00075.696	+00001.238	-00003.100
+0280.00	+001340.00	+00077.444	+00001.501	-00001.297
+0285.00	+001334.25	+00079.443	+00001.203	-00002.086
+0290.00	+001323.78	+00081.126	+00001.329	-00001.072
+0295.00	+001319.45	+00083.128	+00001.372	-00000.660
+0300.00	+001314.53	+00085.002	+00001.432	-00001.130
+0305.00	+001308.22	+00086.841	+00001.541	-00001.435
+0310.00	+001301.73	+00088.991	+00001.346	-00001.810
+0315.00	+001278.14	+00091.273	+00001.212	-00007.328
+0320.00	+001249.00	+00094.342	+00000.566	-00005.047
+0325.00	+001216.07	+00097.096	+00000.728	-00005.056
+0330.00	+001215.40	+00100.046	+00000.381	+00002.053
+0335.00	+001217.77	+00102.118	+00000.605	+00000.504
+0340.00	+001231.20	+00104.204	+00000.519	+00002.436
+0345.00	+001240.18	+00106.143	+00000.629	+00002.746

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TABLE III

T SEC	VG M/SEC	THETA PL DEG	THETA Y DEG	VG DOT M/SEC SQ
+0350.00	+001263.84	+00108.222	+00000.438	+00004.613
+0355.00	+001268.95	+00109.998	+00000.655	+00000.358
+0360.00	+001287.13	+00111.843	+00000.625	+00004.872
+0365.00	+001300.99	+00113.548	+00000.717	+00002.503
+0370.00	+001335.51	+00115.515	+00000.449	+00007.060
+0375.00	+001337.46	+00117.033	+00000.751	-00003.730
+0380.00	+001350.06	+00118.412	+00001.081	+00010.121
+0385.00	+001389.47	+00120.324	+00000.623	+00004.800
+0390.00	+001415.64	+00122.022	+00000.427	+00008.065
+0395.00	+001447.98	+00123.516	+00000.416	+00002.406
+0400.00	+001455.75	+00124.660	+00000.793	+00003.350
+0405.00	+001493.63	+00126.224	+00000.577	+00009.565
+0410.00	+001523.20	+00127.536	+00000.605	+00002.891
+0415.00	+001552.56	+00128.802	+00000.643	+00009.212
+0420.00	+001583.74	+00130.146	+00000.666	+00002.804
+0425.00	+001606.06	+00131.245	+00000.533	+00007.600
+0430.00	+001647.44	+00132.347	+00000.586	+00007.632
+0435.00	+001678.61	+00133.490	+00000.670	+00004.204
+0440.00	+001697.09	+00134.581	+00000.556	+00004.387
+0445.00	+001732.71	+00135.633	+00000.511	+00009.527

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55

TABLE III

T SEC	VG. M/SEC	THETA P.L. DEG	THETA Y. DEG	VG DOT M/SEC SQ
450.00	1779.89	136.514	0.652	6.889
455.00	1814.63	137.457	0.645	7.000
460.00	1849.83	138.364	0.638	7.072
465.00	1885.13	139.236	0.632	7.012
470.00	1919.43	140.077	0.625	6.628
471.56	1929.61	140.334	0.623	6.381
475.00	1950.15	140.889	0.618	5.476
480.00	1971.53	141.675	0.610	2.712
485.00	1970.73	142.444	0.603	-4.183
490.00	1902.33	143.214	0.595	-25.782
499.91	1237.02	145.261	0.662	-99.356
500.00	1227.83	145.288	0.665	-99.330
505.00	777.56	147.160	0.706	-74.120
510.00	491.45	150.196	0.825	-42.871
515.00	341.44	154.073	1.015	-21.255
520.00	262.12	158.539	1.123	-11.656
525.00	216.73	163.006	1.165	-7.006
530.00	188.55	167.249	0.866	-4.555
535.00	170.01	170.854	1.048	-3.044
540.00	156.92	173.380	1.194	-2.257
545.00	146.94	175.012	1.588	-1.772
550.00	138.99	176.475	1.612	-1.436
555.00	132.48	177.829	1.415	-1.187
560.00	126.93	178.321	1.407	-1.044
565.00	122.07	178.333	1.390	-0.915
570.00	117.82	178.124	1.238	-0.795
575.00	114.03	177.671	1.084	-0.724
580.00	110.52	177.282	0.822	-0.696
585.00	107.15	177.259	0.472	-0.638
590.00	104.10	177.111	-0.029	-0.595
595.00	101.27	176.933	-0.284	-0.559
596.60	100.38	176.932	-0.350	-0.560
596.60	100.38	176.932	-0.350	-0.560
596.82	99.72	176.920	-0.362	-5.303
596.82	99.72	176.920	-0.362	-5.303
600.00	88.31	176.752	-0.609	-2.396
605.00	80.97	176.596	-1.127	-0.868
610.00	77.88	176.281	-1.641	-0.464
615.00	75.83	176.160	-2.432	-0.376
620.00	74.06	176.178	-3.257	-0.327
625.00	72.53	176.310	-3.501	-0.283

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TABLE III

T SEC	VG. M/SEC	THETA P.L. DEG	THETA Y. DEG	VG DOT M/SEC SQ
630.00	71.22	176.369	-3.454	-0.252
635.00	69.97	176.531	-3.140	-0.247
640.00	68.78	176.226	-3.339	-0.226
640.60	68.65	176.151	-3.403	-0.224
640.60	68.65	176.151	-3.403	3.012
640.60	68.65	176.151	-3.403	0.768
641.37	56.86	175.022	-4.355	-24.707
641.37	56.86	175.022	-4.355	-24.707
644.60	32.98	169.629	-8.954	-1.537
644.60	32.98	169.629	-8.954	-1.537
647.55	13.41	149.891	-25.592	-2.077
647.55	13.41	149.891	-25.592	-2.077
650.00	12.49	146.425	-28.501	0.012
655.00	12.62	145.349	-29.513	0.028
660.00	12.76	144.316	-30.484	0.030
665.00	12.91	143.287	-31.448	0.031
670.00	13.14	141.924	-32.622	0.030
675.00	13.28	141.054	-33.470	0.025
680.00	13.40	140.306	-34.238	0.021
685.00	13.49	139.668	-34.934	0.017
690.00	13.57	139.126	-35.579	0.026
695.00	13.64	138.609	-36.302	0.008
700.00	13.66	138.316	-36.718	0.002
705.00	13.66	138.150	-37.013	-0.004
710.00	13.62	138.108	-37.189	-0.010
715.00	13.53	138.339	-37.102	-0.057
720.00	13.41	138.689	-36.904	-0.016
725.00	13.33	138.871	-36.875	-0.017
730.00	13.24	139.069	-36.836	-0.017
735.00	13.15	139.284	-36.785	-0.018
740.00	13.05	139.522	-36.783	-0.028
745.00	12.95	139.787	-36.750	-0.018
750.00	12.87	140.040	-36.606	-0.017
755.00	12.78	140.304	-36.412	-0.017
760.00	12.70	140.579	-36.166	-0.017
765.00	12.61	140.867	-35.866	-0.021
770.00	12.53	141.190	-35.478	-0.016
775.00	12.45	141.482	-35.099	-0.015
780.00	12.38	141.771	-34.683	-0.014
785.00	12.31	142.056	-34.229	-0.013
790.00	12.25	142.334	-33.738	-0.012

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57

TABLE III

T SEC	VG. M/SEC	THETA P.L. DEG	THETA Y. DEG	VG DOT M/SEC SQ
795.00	12.19	142.682	-33.021	-0.011
800.00	12.14	142.904	-32.522	-0.009
805.00	12.10	143.084	-32.048	-0.007
810.00	12.06	143.224	-31.597	-0.006
815.00	12.04	143.322	-31.172	-0.004
820.00	12.03	143.279	-30.891	-0.003
825.00	12.02	143.324	-30.481	-0.003
830.00	12.01	143.360	-30.056	-0.002
835.00	12.00	143.383	-29.618	-0.002
840.00	11.99	143.393	-29.168	-0.001
845.00	11.97	143.470	-28.699	-0.001
850.00	11.97	143.436	-28.226	0.002
855.00	11.98	143.351	-27.743	0.004
860.00	12.00	143.222	-27.253	0.005
865.00	12.03	143.045	-26.752	0.007
870.00	12.12	142.621	-26.188	0.019
875.00	12.18	142.340	-25.675	0.008
880.00	12.21	142.136	-25.183	0.007
885.00	12.24	141.963	-24.704	0.005
890.00	12.26	141.822	-24.235	0.003
895.00	12.43	141.087	-23.926	0.181
900.00	12.55	140.451	-23.631	-0.016
905.00	12.41	140.991	-23.058	-0.037
910.00	12.18	142.010	-22.370	-0.057
915.00	11.85	143.548	-21.540	-0.074
920.00	11.44	145.679	-20.524	-0.088
925.00	10.97	148.489	-19.266	-0.100
930.00	10.45	152.090	-17.689	-0.106
933.96	10.03	155.580	-16.153	-0.106

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